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ABSTRACT

The study tests the efficacy of social meta-cognitive training for enhancing social competence in 34 learning disabled (LD) and 35 non LD low achieving incarcerated delinquents. Ss were randomly assigned to treatment, attention control and test-only control groups. Overt social behavior measures were examined in a pretest-posttest control group design. Cognitive social problem solving measures were examined in a random assignment posttest only control group design. Training focused on impulse control, meta-cognitive awareness (methods for locating and labeling salient features of interpersonal problem situations) and meta-cognitive control skills (effectively using social meta awareness information to create adaptive solutions to perceived problems). Results revealed that significantly more LD and non-LD treatment Ss compared to attention and test-only control Ss, demonstrated improvement on number of institutional negative behavior reports recorded, phase level promotions earned, good days credited, and institutional ratings of progress toward treatment goals. LD and non LD treatment Ss also demonstrated learning of specifically trained metacognitive awareness skills. Both LD and non LD treatment Ss demonstrated some but not practical improvement in generating better quality solutions to novel hypothetical social problems. Meta self-assessment was not enhanced at a statistically significant level by training. Blind staff ratings found many more LD treatment Ss as inproved in behavior and somewhat more non LD treatment Ss improved compared to control Ss. (CL)

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Social Meta-Cognition

The Efficacy of Cognitive Training For Social Adjustment of Learning Disabled Delinquents

FINAL REPORT

Co-Principal Investigator: Katherine A. Larson
Co-Principal Investigator: Michael M. Gerber

Student Initiated Grant: G008302160

October 1984

Special Education Program
Graduate School of Education
University of California
Santa Barbara

EC171369

FINAL REPORT

Social Meta—Cognition
The Efficacy of Cognitive Training for Social Adjustment of Learning Disabled Delinquents

by

Principal Investigator: Katherine A. Larson, Ph.D.
Co-Principal Investigator: Michael M. Gerber, Ph.D.

University of California, Santa Barbara
Special Education Program

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October 1984

Further information regarding this project is available from Katherine Larson, Post Doctoral Fellow in Special Education, University of California, Santa Barbara, CA 93106.

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EXECUTIVE SUMMARY

Introduction

Postulating a causal model linking LD to delinquency, this research is the second in a series of investigations testing a theoretical hypothesis which specifies that social meta-cognitive deficiencies increase risk for delinquency in LD youth. The focus of this investigation tested the efficacy of social meta-cognitive training for enhancing social competence in LD and non-LD low-achieving incarcerated delinquents.

The specific purposes of the study were to: (1) examine mediational capacities of cognition for enhancing overt social behavior, (2) document whether delinquent youth manifest deficiencies in social meta-cognition, (3) examine degree of generalization of meta-cognitive skills training by selecting for investigation a range of dependent variables, each predicted as more distant from the training task, context and domain, and (4) examine differential affects of training for LD and non-LD delinquents in order to determine if LD youth require different treatment with respect to rehabilitation during incarceration.

Disclaimer

Inferences, conclusions and interpretations set forth in this report reflect the thinking of the investigators and are not necessarily agreed to by the U.S. Department of Education Special Education Program, the University of California or the

California Youth Authority.

Program Evaluation

With the exception of follow-up analysis and component analysis, all research goals and objectives as outlined in the original proposal were accomplished as specified and in the time frame predicated. Unfortunately, long term follow-up data could not be collected because policy shifts by the state (regarding chronological age and youth placement) resulted in many delinquents, including research subjects, being transferred to other institutions shortly after treatment and terminated. Accordingly institutional records containing follow-up data were either shredded or unavailable. Although some data were permanently lost due to shredding, we are currently attempting to recall records from those institutions who received the transferred subjects. If sufficient data can be obtained, follow-up results will be made available through publication or as an addendum to this report. Although 25 delinquents received training under the component analysis objective, statistical analysis of these data was not feasible due to small sample size.

Direct Delivery of Service

Approximately 117 incarcerated youth directly benefited from this grant project. Some 60 youth (pilot subjects and primary research subjects) received the complete social cognitive training and an additional 25 youth received some component of the cognitive curriculum. About 32 youth received alternative training in survival and daily living skills.

Indirect Delivery of Service

After termination of the project, Katherine Larson trained six of the institution's education staff (3 teachers, resource specialist, school psychologist and supervisor of academic instruction) to teach the cognitive curriculum. The institution was given conditional permission to use copyrighted lesson plans, visual aides and teacher's guides in order to implement the social skills thinking class within the high school program. Dr. Larson continues to work closely with institution staff as an advisor in developing and evaluating the cognitive training program. Thus far, approximately 20 youth have been trained and 20 more are currently being trained using the thinking skills curriculum.

Dissemination of Results

Principal investigators have presented several papers pertaining to theoretical and empirical issues addressed in this study. Papers presented were:

By Katherine Larson and Michael Gerber

CANHC-ACLD State Conference: Oakland, CA (October 1983) "*A Model Curriculum for Training Social Problem Solving*"

CLD International Conference on Learning Disabilities: San Francisco, CA (October 1983) "*Social Meta–Cognition: A Basis for Theory of Social Incompetence in Disabled and Delinquent Youth*"

By Katherine Larson

CEC's 62nd Annual Convention, Washington, DC (April 1984) "*The Effectiveness of Social Meta-Cognitive Training for Social Adjustment in LD and non-LD Delinquents*"

California DLD-CEC Conference, Santa Monica, CA (September 1984) "*The Link Between Research and Practice in the Study of LD Delinquents*"

Additionally, investigators will be submitting a series of empirical and theoretical papers to professional journals for publication.

Acknowledgements

For the realization of a research project which attempts to measure any aspect of human behavior, the participation and assistance of many people are required. From the inception to the final phase, we have had this assistance and are grateful to a large number of individuals who made this study possible.

First and foremost we wish to thank the U.S. Department of Education, Office of Special Education and Rehabilitative Services **Special Education Programs** for providing research funds. Although this is a preliminary investigation, results suggest that SEP's endorsement of this project was extremely worthwhile for both theoretical and social reasons.

We are particularly appreciative of the **California Youth Authority** for the support and enthusiasm of administrators at the state level. **Mr. C.A. Terhune, Mr. C.**

Kuhl and Mr. M. Foote were especially supportive of our efforts.

Data from this study would not have been obtained without the splendid cooperation of teachers and staff at the juvenile institution. We are especially grateful to Gary Delanoeye, Webb Huang, Vivian Crawford and Willie Garrett for their ongoing help and advice

RESEARCH ABSTRACT

Design

Incarcerated delinquents were used in the study. The 69 subjects were sampled from the institution's high school population of low-achievers. These low-achievers were rigorously and specifically identified as LD and non-LD (34 LD and 35 non-LD) and were randomly assigned to treatment, attention control and test-only control groups. Overt social behavior measures were examined in a pretest-post test control group design. Cognitive social problem solving measures were examined in a random assignment posttest only control group design. Institutional staff were blind as to subjects' group.

Training

Training was directed toward three cognitive functions which previous research has shown to be potential mediators of behavior: impulse control, meta-cognitive awareness and meta-cognitive control skills.

Impulse control taught subjects to control impulsive reactions by covertly cueing themselves with self-talk. Meta-awareness provided subjects with methods for locating and labeling salient features of interpersonal problem situations. Salient features of the interpersonal problem solving situation consisted of both "self" and "other" variables. Subjects were taught how to evaluate the usefulness of available information as a means of assessing problem difficulty. Meta-cognitive control skills focused on teaching a general strategy for effectively using social meta-awareness information to create adaptive solutions to perceived problems, and to monitor and evaluate the feedback received after solutions are implemented.

Results

When comparing pre and posttest data, significantly more LD and non-LD treatment delinquents, compared to attention and test-only control delinquents, demonstrated improvement on: (a) number of institutional negative behavior reports recorded, (b) phase level promotions earned, (c) good days credited, and (d) institutional ratings of progress toward treatment goals. Additionally, using anonymous questionnaires, LD and non-LD treatment delinquents rated themselves, compared to the ratings by attention control delinquents, as more improved in behavior and social problem solving.

LD and non-LD treatment subjects also demonstrated learning of specifically trained meta-cognitive awareness skills. Treatment delinquents' meta-awareness knowledge was significantly superior to that of attention and test-only control delinquents. Parallel changes in meta-awareness and overt behavior as a consequence of training provided confirmatory evidence that meta-cognition mediates social adjustment. Training effects on other cognitive variables were mixed.

The non-LD treatment subjects showed a trend to generate more solutions on the cognitive measures of solution generation although this was not a goal of training. Both LD and non-LD treatment delinquents demonstrated some but not practical improvement in generating better quality solutions to novel hypothetical social problems.

Meta-self-assessment (as measured by positive correlations between self-efficacy and actual competence in problem solving) was not enhanced at a statistically significant level by training; all delinquents demonstrated profound deficits in accurate self-appraisal of problem solving capability. Delinquents consistently showed inflated predictions of their actual ability to generate competent solutions. However, when applying individual subject analysis, training was found to have lowered self-efficacy for LD and non-LD treatment delinquents. These lower ratings of self-efficacy in trained subjects was interpreted as a positive effect indicating increased accuracy of self-appraisal of problem solving competence.

There was some concern regarding lack of correspondence between institutional staff evaluations of behavior improvement (from pre to post periods) and actual direct measures of behavior improvement. That is, some treated subjects were rated as not improved when their actual overt behavior had indeed improved and some control subjects were rated as improved when their actual overt behavior had worsened or remained unchanged. Nevertheless, blind staff ratings still found many more LD treatment delinquents as improved and somewhat more non-LD treatment delinquents improved compared to control subjects.

Conclusions

Non-treated delinquents manifested extreme difficulties with a variety of social meta-cognitive skills. These delinquents, representing a randomly selected group of incarcerated youth, were essentially unable to: (a) identify relevant social problem variables, (b) generate multiple or competent solutions to social problems, or (c) provide accurate self-assessment of problem solving competence. Additionally, social meta-cognitive training was found to mediate overt social behavior. Taken together, this evidence of the mediational capacity of social meta-cognition and of the meta-cognitive difficulties of delinquent youth supports a theoretical model postulating social meta-cognitive deficiencies as increasing risk for delinquency. Thus, data from this study support an alternative explanation of the link between LD and delinquency.

Finding that both LD and non-LD low-achieving subjects improved on overt behavior measures, suggests that LD delinquents and other low-achieving delinquents are similar in terms of receptivity to cognitive intervention. Thus low-achieving delinquents and LD delinquents may represent a common sub-group of youth deficient in meta-cognitive social problem solving skills. Evidence suggests that the greater proportion of adjudicated youth within the LD population may be a function of LD youths' susceptibility to deficits in social meta-cognition.

Evidence from this study carries striking implications, from both a social policy and educational perspective, regarding delinquency prevention and rehabilitation among LD and low-achieving youth. Further investigations are critically needed to more completely test theoretical speculations as well as to replicate findings and confirm predictions that special education programs, using a meta-cognitive approach, can be implemented with the expectation of enhancing the general social competence of LD youth.

CHAPTER 1

The Problem and its Setting

Learning Disability

Learning disability has been formally recognized and defined since the 1960's (Lerner, 1981). The learning disabled (LD) individual generally manifests difficulties in one or more cognitive behaviors such as spoken or written language, memory, perception or attention. These difficulties are associated with skill deficits in talking, reading, writing, spelling or computing. Early theories in learning disabilities explained etiology in very narrow and specific terms (Wong, 1979). However, heterogeneity of the learning disabled (LD) population is now well documented (Hallahan & Kauffman, 1982). Accordingly, current conceptions of learning disability are multi-dimensional (Wong, 1979), thus making identification procedures difficult.

Indeed, there has been a persistent problem for researchers and practitioners in establishing reliable identification and definition of learning disability. Until recently, professionals have assumed that it was possible to specifically describe learner characteristics that were unique to LD individuals. Recent evidence has shown, however, that youth identified as LD are not reliably differentiated from other youth who may be low-achieving, emotionally disturbed or mildly retarded (Forness, Sinclair, & Guthrie, 1983; Ysseldyke & Algozzine, 1981). Thus, for purposes of research and clinical application of research findings it is imperative that LD subjects be reliably and rigorously defined.

Learning Disability and Delinquency

Despite heterogeneity in the LD population and varying methods of identification, individuals identified as LD are commonly reported to manifest social skill deficits (Bryant, 1982; Hallahan & Kauffman, 1982; Lerner, 1981). It appears that, for many LD youth, social problems are likely to be observed early and persist over a long period of time (Matthews, Whang, & Fawcett, 1980; White, Schumaker, Warner, Alley, & Deshler, 1980).

Consequently, there has been a plethora of research regarding social difficulties experienced by LD youth; practitioners and researchers alike agree that many LD youth are in need of social skill training (Bryant, 1979). In this regard, no issue has aroused more interest or controversy in recent years than the speculation of a possible connection between learning disability and delinquency and educations' commensurate responsibility to serve and rehabilitate disabled youthful offenders.

Research in the last five years supports the notion of a "link" between learning disability and delinquency. Probability of adjudication for LD adolescents is about twice as great as for non-LD adolescents when the variables of age, SES, race and attitude toward school are held constant (Broder, Dunevant, Smith, & Sutton, 1981). Additionally, youth with attention deficits are reported to have significantly greater adjudication rates (Satterfield, Hoppe, & Schell, 1982). Thus it appears that LD youth are at greater risk for delinquency than are non-LD youth.

However, the nature of the relationship between learning disability and delinquency is not clear. All evidence supporting speculations of a "link" between these two constructs is correlational. Moreover, the three primary theories hypothesizing a causal "link" between learning disability and delinquency have been substantially criticized (Lane, 1980) for lack of empirical evidence. Consequently, no definitive conclusions can be drawn about a causal relationship between LD and risk for delinquency.

Empirical demonstration of a causal factor explaining increased risk for delinquency in LD youth would be of considerable benefit to both society and LD youth. The current outlook for the future of an LD delinquent, as well as for a non-LD delinquent, appears to be extremely negative. Incarceration in adolescence is generally an early predictor of adult criminality. A 30 year retrospective study of delinquent youth found that 60% were arrested as adults and their offenses were slightly more serious (Robins & O'Neal, 1958). Glueck and Glueck (1968) also reported that 80.8% of the delinquents they surveyed had subsequent arrests between 17 and 25 years of age and 60.7% were again arrested between 25 and 31 years of age. Collier and Horowitz (1982) stated that recommitted rates are so high that adult prisons have come to resemble a "Youth Authority alumni organization."

Furthermore, identifying potential causal factors would markedly enhance intervention methods and policy considerations with respect to prevention and rehabilitation. This would be a decisive contribution because current rehabilitation of LD and non-LD delinquent youth has met with only limited success. Since 1960 the youth population between ages 9 and 17 years has increased about 28% while arrests for this age group have risen over 140 percent (Berman, 1980). Arrests for people over 18 years have risen only 29% during this same time.

Moreover, treatment success is equivocal once adolescents are incarcerated. Recidivism rates nationally are between 70% and 80% (Berman, 1980). California, which accounts for nearly 25% of the national juvenile crime prevention and treatment funds (Berman, 1980), places rehabilitation at the heart of its' mandate for the California Youth Authority (CYA). However, Youth Authority statistician George Davis conducted a five-year follow-up of 3000 discharged cases. After five years, 70% of the original 3000 had committed crimes again (Collier & Horowitz, 1982). CYA's difficulties are typical of rehabilitation problems experienced by other states.

From a social perspective it is clear that delinquency and recidivism are very costly for our society. Moreover, if a learning disability implies long term negative life outcomes for some individuals, and if it is true that learning disability is linked to delinquency, then LD individuals are in even greater jeopardy. The importance of this issue compels further investigation in this area.

Theoretical Constructs

From a theoretical perspective, understanding this complex issue requires systematic, theory-driven research to test functional relationships between learning disability and delinquency. Additionally, it is assumed that a necessary and proper scientific activity is to attempt to elucidate any empirical relationships which appear within a body of research. Accordingly, by integrating empirical associations reported to exist between the constructs learning disability, cognitive ineffectiveness, social ineffectiveness and delinquency, the present research postulates a causal model linking LD to delinquency and empirically examines the functional relationship between cognition and behavior.

Definitions

Social Competence

McFall (1982) points out that social competence is not an attribute which resides within an individual and thus it is not a skill or trait per se. Rather the term social competence is an evaluation or judgment about the effectiveness of a person's social functioning. Furthermore, McFall states that competence implies consistently adequate performance. Emphasizing consistency of performance suggests that a person who has performed adequately in the past will likely do so in the future and therefore this person can be expected or predicted to have a certain capability for responding effectively, albeit with some finite degree of generalization to different social situations. Socially valid and consistent social behavior are essential requirements for rehabilitation of adjudicated youth. Accordingly, this study was concerned with increasing social competence of LD and non-LD delinquents. The definition of social competence proposed by Goldfriend and D'Zurilla was adopted. Social competence was defined as:

> ...the effectiveness or adequacy with which an individual is capable of responding to the various problematic situations which confront him. (1971, p. 161).

Learning Disability

Learning disability is defined by the National Advisory Committee on Handicapped Children (1967) as follows:

> Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance, or to environmental disadvantage.

When referring to LD youth in the literature review and discussion chapters, this National Advisory definition will be the referent. However, learning disability was specifically and operationally defined for identifying subjects in this investigation (see Chapter 3, Appendix A).

Juvenile Delinquent.

A legal definition, as opposed to a social or psychological definition, was applied. A juvenile delinquent was defined as:

> A juvenile delinquent is any youth who has been adjudicated in a juvenile

court.

Delimitations of the Study

1. The study did not evaluate other plausible causes of delinquency such as socioeconomic, cultural-familial or social alienation.
2. The study was limited to studying youthful offenders incarcerated in a California State facility.
3. The study did not attempt to examine or draw conclusions regarding other feasible explanations underlying the social deficiencies of the learning disabled.
4. The study did not test other hypothesized explanations concerning the link between learning disability and delinquency.
5. The study did not seek to examine, as a primary objective, influences of sex, race, SES or IQ on social behavior.

Abbreviations

1. LD is the abbreviation for *learning disabled.*
2. NLD is the abbreviation for *non–learning disabled.*
3. JD is the abbreviation for *juvenile delinquent.*

CHAPTER 2

Review of Related Literature

Literature from such diverse fields as special education, sociology, criminal justice, cognitive psychology, social psychology, clinical psychology and behaviorism are directly applicable to research problems addressed in this study. Literature is reviewed and interpreted within the framework of an explicit theoretical model. Thus, this chapter builds a rationale for postulating a theoretical model which specifies a causal relationship between specific cognitive skills and delinquency.

Disabled Delinquents

Delinquency and Handicap

Using PL 94-142 categories of handicapping conditions, Morgan (1979) was one of the first investigators to survey handicapped youthful offenders across the United States and territories. He found that 42.1% of the delinquents, in 204 facilities, were identified as evidencing some type of handicapping condition. Some professionals believe percentages of handicapped delinquents to be much higher. For example, Kansas, Maine and Idaho reported that 100% of their delinquents were handicapped (Keilitz & Miller, 1980). Prout (1981) using criteria based upon Wisconsin state guidelines found that 71% of the state incarcerated youth exhibited a handicap which required special education.

Moreover, two special educators, Brown and Robbins (1979) in the Illinois Department of Corrections, point out that *all* incarcerated juvenile delinquents might be viewed as handicapped under PL 94-142 definition of seriously emotionally disturbed. They argue that criminal records which precede commitment could be perceived to meet 94-142 requirements of "characteristics over a long period of time and to a marked degree."

Such disparity in prevalence rates attests to problems of identifying mildly handicapped youthful offenders. Variable results in identification reflect disagreement in classification (Adelman, 1979), arbitrariness of discrepancy formulas (Forness, Sinclair, & Guthrie, 1983), and heterogeneity of mildly handicapped populations (Weener, 1981).

Nevertheless, it is quite clear that incidence of handicap in the delinquent population is much higher than in the general population. There is evidence to conclude that delinquency and handicap are related. This fact alone merits attention and concern. Questions of why more delinquents are handicapped remain unanswered. Empirical demonstration of a causal link between some handicapping conditions and delinquency would have profound educational and social implications. Learning disabilities, in particular, have been thought to directly affect individuals' risk for delinquency (Bernstein & Rulo, 1976; Graydon, 1978).

Delinquency and Learning Disability

Prevalence of learning disability in the general population has been estimated to be around 3% (Hallahan & Kauffman, 1982; Kirk, 1981) while prevalence of learning disability among delinquents is thought to be much higher. Estimates of 26% (Comptroller General of the U.S., 1977), 37% (Broder, 1981; in the National Center for State Courts-ACLD study), 49% (Podboy & Mallory, 1977), 50% (Proemba, 1967), 61% (L.A. County Sheriff's Dept., 1978), and 73% (Swanstrom et al., 1977) have been made by various researchers.

Currently, there are three hypotheses which attempt to explain the link between learning disability and delinquency (Lane, 1980). The first is the *school failure hypothesis* which postulates that learning disability leads to school failure, which leads to a negative self image. Consequently, LD youth seek out delinquent-prone peer groups to satisfy increased needs for successful experiences. Furthermore, school suspension and drop out increase opportunity for delinquent behavior. Support for this hypothesis comes from clinical observation, school records and tests of basic academic skills. These sources report that delinquents frequently manifest severe academic deficiencies (Jerse & Fakouri, 1978; Dunivant, Saks & Broder, 1981).

The *school failure hypothesis* has been criticised on several accounts. Murray (1976) argued against this hypothesis by pointing out that (a) school is only one setting in which delinquency patterns are thought to develop, (b) school failure is only one of several ways schools might cause delinquent behavior, and (c) learning disabilities are only one cause of school failure. Moreover, Dunivant et al. (1981) evaluated a large scale academic intervention program for delinquents and concluded that "scholastic change was not essential for delinquency reduction among LD juvenile offenders."

The second hypothesis linking LD to delinquency is the *differential treatment hypothesis* which postulates that LD and NLD youth engage in the same rate and kind of delinquent behaviors but elements of the juvenile justice system treat LD youth differently so as to increase incidence of incarceration. Support for this hypothesis primarily comes from a research study by Broder and colleagues. Broder et al. (1981) found that, although LD youth behave no differently from NLD youth in terms of delinquent behavior, expected probability of adjudication for LD youth was much higher than for NLD youth for all conditions of age, SES and ethnicity.

There are several criticisms of the *differential treatment hypothesis*. First, the conclusion that LD youth engage in behavior similar to NLD is refuted by data from a well controlled eight year follow-up study of LD youth with attention deficit disorders (ADD). Satterfield et al. (1982) found that ADD youth evidenced 7 to 28 times more multiple serious offenses, depending upon SES, than matched controls.

Evidence supporting notions that LD engage in behavior similar to NLD adolescents was obtained using self-report methods of data collection. However, self-report techniques for obtaining estimates of criminal behavior have been questioned (Petersilia, 1979, in the Rand Corp. Report). The Rand Report pointed out that rate as well as type of crime or behavior are inaccurately self-reported. Moreover, it seems reasonable to suspect that inaccuracy of self-report would be increased with LD youth, a population characterised by memory, language and cognitive deficiencies.

The third hypothesis is the *susceptibility hypothesis* which postulates that some learning disabilities are accompanied by personality attributes such as impulsivity, emotional lability, poor social perception and deficiencies in evaluating cause and effect. In turn, these attributes increase the likelihood of delinquent behavior.

Criticism of the *susceptibility hypothesis* points out that this perspective is essentially a trait-type conceptualization of social competence. There has been serious criticism leveled against trait approaches for defining social skill (McFall, 1982). Moreover, the *susceptibility hypothesis* fails to address the issue of what caused these personality attributes. In other words, it could not be isolated to "LD-ness" because there are certainly other psychological and environmental sources that produce negative attributes likely to increase delinquency.

Thus, a number of professionals have speculated that learning disabilities contribute to delinquent behavior. Yet the three major hypotheses are not adequately supported by existing empirical evidence. Because LD delinquents (as well as other delinquents) are at risk for becoming adult criminals, the outlook for their becoming successfully mainstreamed into general society seems dim. Thus, it is critical to identify why LD youth are at increased risk for delinquency.

Summary

Many youthful offenders suffer from some sort of handicapping condition. While it seems clear that at least a correlational association between learning disability and delinquency has been demonstrated, data supporting a causal relationship have not been generated by recent research. Several hypotheses of causal links between LD and delinquency have been postulated. Available evidence warrants argument against these hypotheses.

Rehabilitation and prevention efforts would be decisively enhanced if they were based upon an empirical foundation (Lane, 1980). The need for effective delinquency prevention and intervention is especially great for LD youth. LD youth are adjudicated at about twice the rate as NLD youth (Zimmerman et al., 1981) and adjudicated juveniles tend to become adult criminals. Empirical investigations of causal links will provide evidence for two primary concerns regarding delinquency: prevention and rehabilitation.

Theoretical Constructs

Need For a Theoretical Model

Unfortunately, and as previously noted, it is not clear if a causal relationship exists between learning disability and delinquency. Research has not been systematic and most evidence is either ambiguous or suffers from methodological weakness.

One factor that possibly contributes to lack of systematic research, seems to be absence of a testable theoretical model postulating some underlying construct linking LD to delinquent behavior. Therefore, the present research postulates and tests a theoretical model which intergrates relevant constructs, specifically examining cognition as a possible factor linking LD and risk for delinquency. What evidence is there for hypothesizing that cognitive deficits increase risk for delinquency?

Cognitive Inefficiencies and Learning Disability

LD youth have been found to exhibit profound deficits in many cognitive problem solving functions. In the US, Canada and in the Soviet Union, studies on impersonal problem solving reveal that LD children do not spontaneously supply their own organization or structure to problem tasks (Wozniak, 1979). LD as a group may fail many tasks not because of basic deficits but because they fail to use appropriate task strategies (Torgesen, 1982). In general LD youth appear to perform poorly on tasks because they fail to spontaneously employ appropriate problem solving skills. Indeed, some believe that underlying deficits involved in a learning disability may be lack of or ineffective problem solving abilities (Torgesen, 1977) with deficits in skills such as identifying relevant variables, impulse control, evaluation of possible strategies, persistence and self-monitoring (Hagen et al., 1982; Forness & Esveldt, 1975; McKinney & Feagans, 1981).

Given that LD youth manifest cognitive deficiencies in non-social tasks and considering the frequently noted social difficulties of LD youth, it seems reasonable to speculate that LD youth will manifest ineffective cognitive problem solving skills when facing a *social* task. This evidence lends initial support for formulating a theoretical model which reflects relationships between the constructs learning disability, cognition and social behavior. However, even if LD youth do exhibit social cognitive deficiencies, are these deficiences related to social maladjustment?

Social Cognitive Ineffectiveness and Social Maladjustment

Hypotheses that deficiencies in problem solving skills often lead to emotional and behavioral disorders requiring psychological treatment, have received considerable support (Bandura, 1977; D'Zurilla & Goldfried, 1971; Ross, 1974, 1976; Rotter, 1978). Individuals whose social problem-solving processes are characteristically ineffective are assumed to be more likely viewed as maladjusted, incompetent, and abnormal.

Extensive work by Spivack, Platt, and Shure (1976) lends additional support to this hypothesis. Spivack et al. (1976) report that deficits in cognitive social problem solving skills are consistently found in non-normal populations of all ages when IQ and verbal fluency are held constant. Spivack and colleagues found that cognitive problem solving skills such as weighing pros and cons, generating options, conceptualizing a step by step process to a goal and perceiving the situation from another's perspective are skills which seem to be lacking or deficient in many socially incompetent individuals.

Thus, there is substantial correlational data linking ineffective cognition to social maladjustment. As previously noted, correlational data are not sufficient for supporting a causal link. Furthermore, to support causal links between learning disability and social cognitive deficits it is necessary to argue that LD individuals manifest social cognitive deficits.

Social Cognitive Problem Solving Difficulties and LD

It has long been recognised that LD youth exhibit social and or behavioral problems (Hallahan & Kauffman, 1982; Lerner, 1981). It appears that socially incompetent LD youth manifest, within social contexts, a variety of cognitive problem solving deficits. Investigators have pointed out that the learning disabled have difficulties in interpreting the mood or communications of others (e.g., Johnson & Myklebust, 1967; Kronick, 1978; Lerner, 1981), in judging one's impact on others (e.g., Hazel, Schumaker, Sherman, & Sheldon, 1982), in predicting social consequences (e.g., Bruno, 1981), interpreting situations (e.g., Pearl & Cosden, 1982), in understanding gestures and facial expressions (e.g., Maheady & Maitland, 1982), and in perspective taking (e.g., Bachara, 1976). However, little research has been conducted to determine if these differences between LD adolescents and NLD adolescents on cognitive problem solving skills actually contribute to life adjustment patterns.

Some research relating to this question has recently been completed by Schumaker and her colleagues (Schumaker, Hazel, Sherman, & Sheldon, 1982; Hazel et al., 1982). Schumaker et al. found that NLD adolescents were significantly better than LD adolescents on eight social skills assessed, including social problem solving. However, LD youth performed no better on *cognitive social problem solving* or other social skills than a group of delinquent adolescents. The LD youth were also found to be no better on social problem solving skills than were "troublesome" youth attending an alternative school.

These findings are significant, not so much in finding that LD youth are less competent in social skills than their NLD peers, but in finding that some LD youth exhibit social cognitive deficits similar to youth who have been referred by society for social adjustment problems (i.e., the JD and troublesome group). Thus, clinical observation and empirical data indicate that maladjusted LD youth appear to manifest cognitive deficiencies when facing social tasks. This lends further support for hypothesizing a causal connection between the constructs learning disability, delinquency, and cognitive deficiencies. The last piece of critical evidence needed for postulating such a hypothesis requires arguing that JD youth also manifest social cognitive deficits.

Social Cognitive Problem Solving Difficulties and JD

Delinquent youth are often found to exhibit deficits in interpersonal problem solving skills in addition to academic achievement. Three interpersonal correlational studies, comparing normal peers to adolescents who were drug addicts, psychiatric residents or "poorly self regulated", found problem adolescents significantly less able to: spontaneously explore pros and cons prior to making decisions; generate alternative options, conceptualise a step by step process to a goal, perceive situations from another's perspective (Spivack, Platt, & Shure, 1976).

Additionally,, JD youth, a heterogeneous population including many youth who fit clinical descriptions of learning disability (Prout, 1981), have been found to exhibit interpersonal cognitive problem solving deficits. Jesness (1971) reported, after testing 1173 institutionalized delinquents using the California I-level topology (inter-rater reliability was .88), that 54% of the delinquents had deficiencies in understanding that their own behavior has something to do with getting what one wants (general orientation to plan), in estimating differences among others and between self and others and understanding needs, feelings and motives of others (perspective taking), in wanting to plan for the future before acting (impulse control, problem formulation), and in predicting accurately other's responses to their own actions (predicting consequences/decision making).

When compared to non-delinquents, adjudicated youth are found to be less skillful in a variety of problem solving behaviors. Poor perspective taking (Chandler, 1973; Gough, 1948; Little, 1979; Rottenberg, 1974; Sarbin, 1954) and poor impulse control (Stein et al., 1968; White, 1965) are two specific problem solving deficits consistently demonstrated in JD populations. When comparing delinquents with average or "super star" highschoolers on interpersonal alternative thinking, Freedman (1974) found delinquents significantly less able to provide effective solutions to social problem situations.

Thus, these data regarding delinquents provide additional evidence for hypothesizing that cognitive deficiencies are a causal link between LD and delinquency. Little and Kendall (1979) state that the evidence "support the notion that legally defined problematic behavior in adolescence (i.e., delinquency) is, in part, a function of inadequate interpersonal problem solving skills" (p. 83)

Summary

Evidence indicates that social cognitive difficulties are associated with maladjustment. Moreover, LD, behavior disordered and JD youth exhibit similar deficiencies in cognitive interpersonal problem solving skills. All groups have been found to be deficient in perspective taking, impulse control, generating quality solutions, predicting consequences and understanding and using relevant social cues. Taken together, these data point out associations between the constructs learning disability, cognitive ineffectiveness, social maladjustment and delinquency. Thus, evidence is sufficient and appropriate for supporting the reasonableness of hypothesizing that cognitive deficiencies place LD youth at increased risk for delinquency.

Training Studies as Evidence that Cognition Mediates Behavior

After hypothesizing that cognitive deficiencies mediate social adjustment, the next logical question asks what kind of social cognitive deficiences can be postulated as mediating social adjustment. Data from training studies seem to be most fruitful for deriving answers to this question. In other words, by determining what skills were trained and what behaviors were affected (and vice versa) it is possible to make predictions about mediational capacities of specific cognitive skills. Unfortunately, evidence will be presented showing that data from cognitive training studies is primarily of three types: (1) unclear as to what was trained or (2) unsuccessful in changing overt social behavior or (3) did not measure overt behavior change. Therefore, findings from training studies are minimally useful. Consequently, predicting which specific cognitive factors are potential mediators of behavior will have to be deduced logically and theoretically by postulating requirements for generalization.

Cognitive Training with LD and JD Populations

Interpersonal cognitive problem solving treatment programs have had success in changing cognition and some overt social behaviors in a wide variety of populations with different kinds of problems, especially with children described as aggressive or withdrawn (Meijers, 1978). Cognitive training is not a new method of treatment for LD individuals. Cognitive training has been successfully used with LD students to enhance behaviors related to academic performance and social interaction (Harris, 1982; Lloyd, 1980; Meichenbaum & Asarnow, 1979).

Snyder and White (1979) found that cognitive self-instruction training resulted in significant improvement in daily living social skills of incarcerated delinquent adolescents when compared to contingency awareness and control treatment groups. Most cognitive training studies; however, have met with only limited success in demonstrating improved overt social behavior in the natural environment (Meichenbaum, 1982). Furthermore, with few exceptions, training studies investigating efficacy of problem solving training have not measured the impact of training on actual behavior (Meijers, 1978; LaDouceur & Auger, 1980). Perhaps this is because difficulties in achieving generalization have been underestimated (Kirschenbaum & Tomarken, 1982).

Five studies with delinquents (Kifer et al., 1974; Parsons & Alexander, 1973; Robin et al., 1977; Sarason, 1968; Sarason & Ganzer, 1973) have incorporated problem solving skills as central features of treatment. Positive effects were reported in all studies, with three studies reporting generalized behavior change as measured by behavioral ratings or recidivism follow-up. Unfortunately, the mediational capacity of problem solving training per se was confounded by including other kinds of training in treatment (e.g., parental participation, vocational training, interpersonal communication). Moreover, there has been no research to demonstrate if these interventions are effective for different subpopulations of delinquents, especially for LD youth.

Summary. Little and Kendall (1979) note that the number of problem solving treatment programs to remediate problem solving deficits in delinquents has been limited despite encouraging preliminary evidence. With regard to future research in training delinquents to problem solve, they state, "the payoff is likely to be worth the effort" (p. 107). Problem solving training seems directly applicable to remediating interpersonal deficits which LD and JD populations exhibit. There have been some training research supporting mediational capacities of social cognition. Many treatment programs, however, have included non-cognitive techniques and therefore the data is ambiguous with regard to the cognitive aspects of treatment.

Generalization of Cognitive Training to Overt Behavior

Of major concern in any treatment program is the issue of generalization of learned skills to new contexts. Furthermore, with regard to efficacy of cognitive treatment, it is essential to demonstrate that newly learned cognitive skills actually mediate overt social competence. This implies that training must not only generalize to new contexts but also to overt behavior outside of the cognitive domain.

Additionally, social skills training with LD adolescents suggests that learning disabled youth do not generalize their newly learned social skills to other contexts.

Gorney-Krupson et al. (1981) and Whang et al. (1981) reported that, outside of training, LD students use only a few of the skills taught or use them infrequently. Schumaker and Ellis (1982), in testing the generalisation effects of social skills training, found that LD adolescents did not automatically generalise recently learned skills to novel role playing situations or to the natural environment.

Similarly, Stokes and Baer (1977) note widespread failures in generalisation for studies applying the "train and hope" method of treatment. Given the generally discouraging evidence on generalization, several investigators conclude that generalization must be actively addressed in designing a treatment program (Wildman & Wildman, 1980; Kirschenbaum & Tomarken, 1982).

Following from this, it is apparent that training curriculum needs to be developed from a theoretical perspective specifically addressing the issue of how to increase generalization. To do this, it must first be theorized why previous problem solving training has met with only limited success in terms of changing overt behavior. Then it is necessary to hypothesise which cognitive skills appear to compensate for failures of generalization.

Generalisation and Meta-Awareness

Why hasn't generalisation of cognitive training been greater? If general social competence not only requires an adequate response repertoire but also the skill of knowing when and where to apply a specific response, then ability to discriminate situations in terms of response requirements would greatly increase the likelihood of an effective response as well as increase the probability of generalization of specific responses to a variety of situations.

However, training research in the area of social problem solving has not attempted to train skills, such as awareness of problem variables, which may help discriminate the response requirements of a situation. Instead, current training programs have focused on teaching cognitive control skills such as stating the problem, generating solutions, evaluating consequences and taking action. Some more thorough programs have also taught a get-feedback procedure (Meijers, 1978). These skills may be necessary but are apparently insufficient in view of the argument that competent social functioning also requires individuals to perceive, to comprehend and to use relevant problem variables.

Identification of variables which help discriminate requirements of a problem have been described as meta-cognitive skills. Knowledge or awareness of these variables is referred to as *meta-awareness.* Among other elements, Flavell and Wellman (1977) define the awareness aspect of meta-cognition to include an awareness of *person variables* (that is, self appraisal of personal attributes which affect the task difficulty) and awareness of *task variables* (knowledge of parameters, expectations and situation attributes which affect the task difficulty). In the case of a social problem, task variables can be be conceived as variables pertaining to significant others in the situation and person variables pertain to the self.

Thus, the limited success of current cognitive training seems possibly due to failure to enhance awareness and usage of relevant social problem variables; that is, a failure to remediate deficits in social meta-awareness.

A pilot study to the present investigation was conducted to assess social meta-awareness skills of delinquents as compared to matched non-delinquents (Larson &

Gerber; Note 2). Statistically significant qualitative as well as quantitative differences were found between JD and non-JD responses regarding the kinds of meta-awareness *self* and *other* variables identified as being important to social problem solving. These data give tentative support to the hypothesis that social meta-awareness may be an important variable to consider when training cognitive skills.

Thus, the theoretical rationale behind the training curriculum of this investigation is based on Hagen, Barclay and Newmans' (1982) conceptualisation that two meta-cognitive functions, the *awareness function* (knowledge of relevant variables) and the *control function* (skills in defining the problem, generating strategies, and evaluating feedback) present a continuum of problem solving knowledge from "knowing about cognition" to "regulation of cognition".

This perspective views functions of control and awareness as a reciprocating system. Thus successful problem solving was hypothesised as based on a state of acquired knowledge (i.e., *awareness*) as well as a process of using that knowledge (i.e., *control*). Previous cognitive training programs have focused only upon control skills and achieved little success in changing overt social behavior, while preliminary research (Note 1) indicates that delinquents may have deficiencies in specifically defined meta-awareness skills.

Generalisation and Components of Training

Additionally, it has been suggested that poor problem solving may be the result of an inability to inhibit impulsive responding (D'Zurilla & Goldfried, 1971). Studies have shown that the present population typically responds impulsively with aggression or withdrawal, which prevents engaging in an adequate problem solving sequence (Hallahan & Kauffman, 1982; Kendall & Finch, 1978; Ross, 1976). Given this evidence, a skill of learning to control first impulses seems to be a necessary, although not a sufficient condition, for effective social problem solving.

Thus, the content of the training for this investigation was comprised of three components or skills: *impulse control, meta-awareness* and *meta-control* functions. Impulse control training entailed specific instruction in covert control of initial impulses. Meta-awareness training taught systematic selection of and conscious self-reflection on salient person and other problem variables. Finally, meta-control training taught how to systematically organise the problem information into sequential steps, how to produce quality options and how to monitor action for effectiveness. See Appendix E and F for details on curriculum content and a sample training lesson.

Summary

Stokes and Baer (1977) define generalisation as "the occurrence of relevant behavior under different, nontraining conditions (i.e., across subjects, settings, people, behaviors and/or time) without the scheduling of the same events as had been scheduled in the training conditions" (p. 350). Previous social cognitive treatment programs have trained (*meta-control*) skills and achieved limited success in generalising learning to new situations and response domains. Therefore, it was hypothesised that generalisation of social cognitive skills additionally requires training in social (*meta-awareness*) skills.

In designing any training program it is imperative to actively attempt to boost generalization. Over and above attempting to boost generalization, it is important to specifically measure the degree of generalization achieved from training. Some interventions will yield only situationally specific or domain specific effects. Although these effects may we useful in a crisis or for short term problems, these interventions are clearly of limited consequence in dealing with young people who exhibit persistent social difficulties.

Unfortunately, too many cognitive training studies have not attempted to document the degree of generalization effects which can be expected from the training. For example, several studies which trained social cognitive problem solving skills were able to demonstrate positive effects; however, these effects were measured in cognitive paper and pencil tasks and/or in behavior ratings (Allen et al., 1976; Camp et al., 1977; Cole et al., 1982; Nezu & D'Zurilla, 1981; Siddle, 1980); there was no attempt to directly assess generalization of training to overt social behavior. Hall (1980) and Kazdin and Wilson (1978) suggest that measurement of both target behaviors and contexts are needed to fully explain the generalization process associated with a training program.

This study assessed degree of generalization of treatment effects across context, across task and across response domain. Dependent variables were defined to represent a continuum of generality from training. Unlike previous rehabilitation research which has not assessed treatment generalization across tasks and contexts *within* an institution, this project will provide evidence of the degree and type of generalization effects which can be expected from a cognitive training program and what might need to be changed in order to extend these effects to the outside.

The Theoretical Model

Pulling together these various areas of literature, a theoretical model is postulated which integrates empirical associations reported to exist between the constructs: *learning disability, ineffective meta–cognitive problem solving, social ineffectiveness and risk for delinquency* (see Figure 1). This model reflects the conceptual framework of this research project.

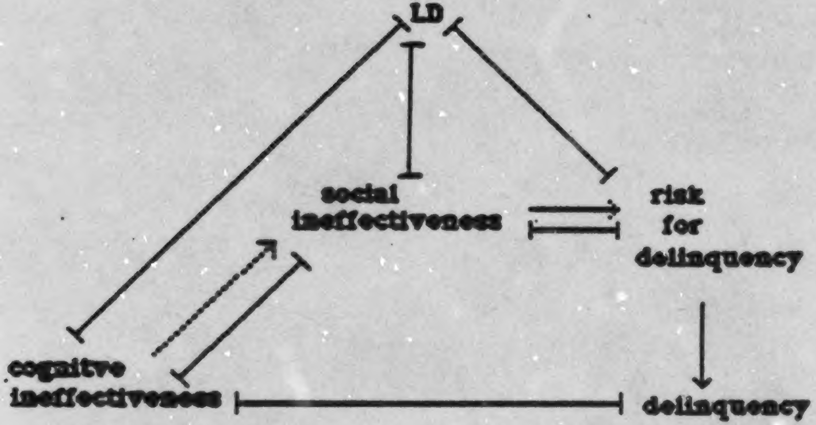
The solid connecting lines between the constructs of Figure 1 are blunted, indicating that only correlational associations have been reported in previous research. Broken lines in Figure 1 illustrate the empirical focus of this research project.

As articulate as the model may appear on paper, in actuality the constructs are very complex. Each of the constructs are multi-faceted and comprised of sub-components. For example, if just one of the nodes of the model is exploded, a picture that looks something like Figure 2 emerges where cognitive ineffectiveness is seen as containing several components and of course there are components within these sub components. Thus inferences and conclusions developed and put forth in this research should not be interpreted as an attempt to make simple so confusing a field.

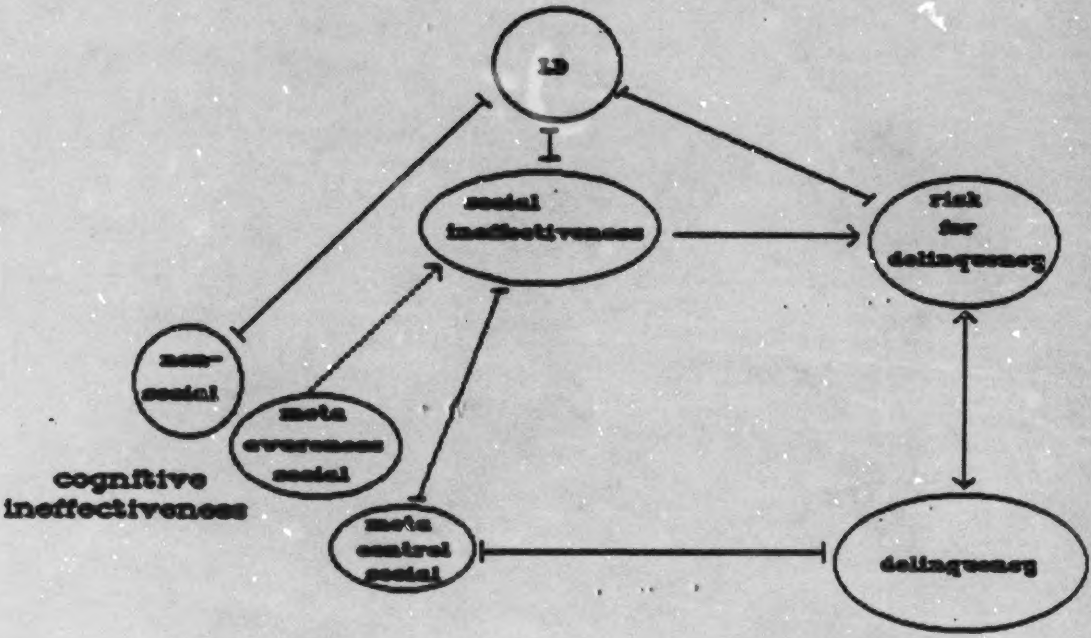
Emerging from a synthesis of literature just reviewed, the basic hypothesis underlying this model is that delinquency and recidivism are reduced by reducing risk for delinquency. In turn, risk for delinquency may be reduced by 1) remediating skill

RESEARCH CONSTRUCTS

Figure 1


LD
social ineffectiveness
risk for delinquency
cognitive ineffectiveness
delinquency

RESEARCH CONSTRUCTS
Figure 2


LD
social ineffectiveness
risk for delinquency
non-social
meta awareness social
cognitive ineffectiveness
meta control social
delinquency

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deficits which are associated with risk for delinquency and 2) remediating skills which can [illegible]late overt social behavior such that one can predict colateral generalization of the trained skills to new contexts and new response classes. Do delinquency rehabilitation programs offer any insight into theorizing that cognitive training is a potentially effective intervention technique for reducing risk for delinquency becuase it fulfills assumptions #1 and #2?

Treatment for Delinquents

Behavior Modification as Treatment

Behavior modification has been the most widely used "treatment of choice" in correctional facilities and is still heavily employed. Recently there has been a growing dissatisfaction with behavior modification as a tool for rehabilitation because of lack of generalization of effects beyond treatment context (Kazdin, 1975; Wahler, Berland, & Coe, 1979), undesirable effects of external extrinsic orientation (Meichenbaum, 1979), lack of resistance to extinction (Mahoney, 1977) and because it may prevent learning how to learn (Sabatino, 1981).

From a learning theory perspective, ineffective behavior occurs because an individual has never had an opportunity to learn effective responses appropriate for a particular type of situation or receives no reinforcement for doing so. Thus from this perspective, one obvious difficulty for training is that "response patterns, even in highly similar situations, often fail to be strongly related" (Mischel, 1978; p. 177). For this reason many attempts to teach specific social skills have failed to produce behavior that generalizes enduringly to other situations or even transfers from the laboratory to other behavior settings (e.g., McCombs, Filipasak, Friedman & Wodarsi, 1978; Kazdin, 1975; Keeley, Shemberg & Carbonell, 1976). However, for reducing crime, it is obvious that transfer of training is of paramount importance.

Given this, Burchard and Harig (1976) and Emery and Marholin (1977) question the meaningfulness of typical rehabilitation efforts which focus upon teaching specific responses. Furthermore, high rates of recidivism appear to support the contentions that specific skill training has not been sufficient. Either skills have not been generalized to outside situations or have been irrelevant for reducing delinquent acts.

Thus the challenge of rehabilitation is not one of modifying behavior within the institution but rather one of training youth to manage their own behavior so that relevant social changes are generalized to the outside community. Cognitive training, in particular, has been thought to directly enhance self-regulation of behavior.

Cognitive Training as Treatment

Although special educators often make note of important contributions of behavior modification procedures (Harris, 1982), there is growing evidence of special education's dissatisfaction with behavior modification (e.g., Douglas, 1975; Douglas, Parry, Maron, & Garson, 1976; Meichenbaum, 1979). Sabatino et al. (1981) state that special education has become overly dependent upon intervention strategies unrelated to cognition and that behavior modification techniques may prevent exceptional children from learning how to learn.

Psychology and educations' growing dissatisfaction with behavior modification techniques led to a treatment model emphasizing cognitions, feelings and behaviors as interactive and reciprocal. Intervention procedures emanating from this perspective are directed toward modifying, in stating or extinguishing cognitions for purposes of enhancing behavior and generalizing learning.

Social cognitive problem solving training is hypothesized as appropriate for social skill development in delinquent populations because cognitive skills may more easily generalize and mediate behavior in a variety of social contexts and because cognitive skills may increase self-regulation.

Cognitive intervention approaches have generally been labeled cognitive behavior modification (CBM). CBM is a generic term encompassing a variety of methods and techniques. Meichenbaum (1979) notes that CBM training can teach cognitive skills that are either specific and concrete or general and abstract. A common purpose of CBM training focuses on turning control of behavior back to the learner. Self-regulation training appears appropriate for remediating skill deficits associated with LD youth. Harris (1982) notes that CBM may be especially appropriate for exceptional children because they often exhibit characteristics of learned helplessness, external locus of control, production and mediational deficiencies, deficits in problem solving, self-regulation, inhibition, and means-end thinking.

Problem solving training is one regimen falling under the CBM umbrella. D'Zurilla and Goldfried (1971) conceptualized problem-solving as both a self-control procedure and a learning process involving cognitive strategies. Cognitive problem solving skills are hypothesized as general skills applicable to a variety of situations and consequently useful for increasing generalization. D'Zurilla and Goldfried (1971) identified five skills of problem solving: (1) generation orientation, (2) problem definition and formulation, (3) generation of alternatives, (4) decision-making, and (5) verification. Research on interpersonal cognitive-problem solving (ICPS) has identified means-end thinking as an additional skill in problem solving. Problem solving training programs have focused on teaching some or all of these skills of thinking.

These five skills have also been described as meta-cognitive *control functions* or executive control functions (Flavell & Wellman, 1977; Campione & Brown, 1977). They are hypothesized as skills regulating general cognitive functioning during the problem solving process.

Thus, major assertions of the cognitive problem-solving model are that cognitive processes (a) enhance self-control and thus mediate behavior and (b) generalize across a wide range of situations. The implication of course being that mediation and generalization are "built in." Preliminary evidence indicates that generalization of training may occur but by no means is generalization automatic for a cognitive intervention program. Moreover, there have been few studies specifically designed to assess the characteristics of generalization under the cognitive model. Thus efficacy for cognitive approaches to delinquency rehabilitation remains untested.

Summary

Interest in cognitive training has grown out of dissatisfaction with results of behavior modification approaches. Behavior modification approaches have met with only limited success in terms of lowering recidivism rates. In turn, recidivism implies lack of learning or generalisation of social skills to the outside community. Researchers and clinicians are increasingly indicating that teaching exceptional children how to think is important if generalisation of skills to novel contexts is to be expected (Borkowski & Cavanaugh, 1979; Deshler et al., 1981; Meichenbaum & Asarnow, 1979). Emphasis for cognitive training is given to teaching self-control and awareness of one's own learning process (Campione et al., 1981), skills hypothesised as enhancing social competence in a wide variety of situations. However, there is a paucity of systematic empirical evidence to support claims that cognitive skills training generalizes to overt social behavior.

General Problems and Purposes of the Research

With reference to the model of Figure 1, basic research questions emerged through speculations that a cognitive deficiency hypothesis may fulfill both conditions postulated for reducing risk for delinquency. Testing the hypothesis which predicts that social meta-cognitive deficiencies increase risk for delinquency was the empirical focus of this research.

Accordingly, the line of investigation for testing this hypothesis proceeds first with establishing that meta-cognition is able to mediate socially meaningful overt behavior. Confirming mediational capacities of cognition is a critical preliminary step in terms of testing causal connections within the theoretical model. This research was specifically designed to provide evidence of the mediational capacities of social meta-cognition.

A second piece of evidence essential to support the hypothesis requires demonstrating that LD delinquents do indeed manifest deficiencies in social meta-cognition. Providing this data requires a second research study following from the current investigation. The present investigation did, however, indirectly document deficiencies in meta-cognitions. By using a randomly selected untreated group of delinquents (i.e., test-only control subjects) this study provided preliminary data regarding social meta-cognition skills in adjudicated youths.

Summary

The present research was designed to go beyond correlational associations by supporting conclusions about functional relationships within a theoretical model. The study was concerned with the functional relationship between thinking and behavior (see broken lines in Figure 1). Of particular interest were a group of social and interpersonal meta-cognitive problem-solving skills hypothesized to influence social competence.

The Importance of the Study

This is an important area of study for both social and scientific reasons. The issues are of equal importance to teachers and other applied personnel, as well as to researchers.

The study can make a potentially significant contribution by (a) examining the capacity of cognition in mediating behavior, (b) providing conclusions about effectiveness of cognitive rehabilitation efforts with LD and NLD delinquents, (c) discovering if LD delinquents have differential needs with respect to treatment during incarceration as compared to NLD delinquents, (d) providing initial data with regard to training and assessing social meta-cognition in socially ineffective populations and (e) providing groundwork for additional cognitive training social skills research with other sub-categories of delinquents, non-institutionalized delinquents and behavior disordered, learning disabled youth.

Summary for Chapter 2

What support can be drawn for the hypothesis suggesting meta-cognitive deficits increase risk for delinquency? Two types of evidence address this question. First there are the training studies which, as previously noted, demonstrate hopeful but inconclusive support for such a hypothesis because cognition appears to mediate social adjustment. Additionally, there are the correlational studies which have consistently identified cognitive problem solving deficits in both LD and JD populations. Causal conclusions regarding the relationship of LD and delinquency cannot be drawn, however, because these data are either correlational or ambiguous.

Specific Research Problems to be Studied

The general purpose of the research project is: To examine the efficacy of cognitive training in enhancing the social functioning of incarcerated LD and NLD delinquents and to document if untreated delinquents appear to manifest social cognitive deficits. The solutions of the sub-problems, taken together, combine to resolve the major purpose of the research project.

The Sub-Problems to be Solved Are:

1. To determine the degree of generalization of training effects across different contexts and behavioral domains.
2. To determine whether the proposed training program is effective in enhancing the overt social behavior of LD and NLD juvenile delinquents.
3. To determine whether the proposed training program differentially effects LD and NLD juvenile delinquents.

Research Hypotheses

Sub-Problem 1

1. LD treatment subjects, as compared to LD attention and test-only control subjects, will show significant superiority on both cognitive and overt behavior measures.
2. NLD treatment subjects, as compared to NLD attention and test-only control subjects, will show significant superiority on both cognitive and overt behavior measures.

Sub-problem 2

1. LD treatment subjects will perform significantly better than either LD attention or test-only control subjects on overt dependent variables.
2. There will be no significant difference between LD attention and test-only control subjects on overt dependent variables.

3. NLD treatment subjects will perform significantly better than either attention or test-only control subjects on overt dependent variables.
4. There will be no significant difference between non-LD attention and NLD test-only control on overt dependent variables.

Sub-problem 3

1. There is no basis on which to predict how treatment will differentially effect the LD and NLD treatment groups.

CHAPTER 3

Methods

Subjects

Subject Selection

All youths participating in this research project were officially designated as presenting a serious danger to society and were incarcerated in a security institution. At the request of institution school administrators, the subject pool was restricted to the institutions' lowest achieving delinquents. This was about 50% of institutions' high school population. Low-achieving subjects were those receiving remedial reading and/or remedial English classes in conjunction with the regular high school curriculum. Eligibility for remedial classes required a reading achievement level at or below the sixth grade and inability to achieve in regular English classes. Identified LD as well as NLD low achieving subjects participated in the remedial program.

Restricting the subject pool to low-achieving subjects was favorable for several reasons. First it provided a large sample from a recognizable and important sub-population of delinquents (i.e., academically deficient). Secondly, data describing academically deficient youth would more appropriately generalise to "at risk" students in public schools; therefore, educational implications from results of the study would be more clear. Thirdly, results using low-achieving youth would be more comparable to other research on learning disabilities because most LD research does not reliably differentiate LD youth from a heterogeneous population of low-achievers (Algozzine & Ysseldyke, 1981; Ysseldyke, Algozzine, Shinn & McGue, 1982).

LD Identification

Many research investigations with LD populations simply report that LD subjects were those identified by school district personnel or some agency. Reporting subject selection in this manner presents two problems. First, it is difficult to determine actual characteristics of the populations sampled in these studies. Second, it is difficult to determine if identification criteria reliably relate to students' presenting behaviors.

Therefore, to increase reliability and replicability, LD identification criteria were developed empirically by modeling the institutions' referral and identification process and then applying derived criteria objectively to the total sample of low-achieving delinquents.

The rationale for using such an approach for identification stems from recent literature in the area of LD identification. Ysseldyke (1983, Note 3) reviewed research on LD identification and concluded that accuracy in identification of LD delinquents depends upon criteria used. Moreover, Ysseldyke and Algozzine (1979) investigated reliability and validity of standardized assessment instruments and concluded that most standardized instruments are technically inadequate. Additionally, Forness et al. (1983) applied eight commonly used discrepancy formulas to the same sample of high risk subjects and found greatly variable results, depending upon the formula used, with regard to numbers of subjects identified as LD. Thus, it is apparent that current methods for discriminating LD delinquents from low-achieving delinquents students are not reliable. These identification difficulties present serious problems for researchers working with LD subjects.

By modeling the institution's decision making process, an ecologically valid and consistent identification procedure was obtained (Gerber & Semmel, in press). Thus, an important assumption in modeling identification practices was that referral variables, such as teachers' perceptions of subjects' teachability, are not arbitrary and yield a consistent picture of subjects' responsiveness to instruction (Borko & Cadwell, 1981).

Although increasing rigor, objectivity and consistency in LD identification is desirable, it may limit generalization of findings when identification is very specific. With respect to this study, external validity is increased as LD and NLD delinquents are assumed to first represent a population of low-achievers and secondly to represent sub-groups within that population. Thus, external validity for low-achieving maladjusted youth is logically defensible.

Identification Decision Rules

A decision rule procedure for discriminating LD from NLD low-achieving delinquents was developed. This was accomplished by modeling institutional decision making with regard to LD referral and identification. Institutional identification had been determined using state mandated eligibility criteria based on size of discrepancy between measured ability and achievement. However, ultimate LD identification was based upon clinical judgement of an IEP team in terms of how well the delinquent functioned in the regular school program.

A three part decision rule was derived after comparing 44 subjects on achievement, ability and teachers' perception of teachability and need for special education. The subjects used in the modeling process were 24 referred and identified LD delinquents and 20 non-referred NLD low-achieving delinquents. Appendix A presents a short discussion of identification decision rules and they were how determined. Using the derived decision rules, 92% of institution identified LD subjects were identified as LD. That is, 22 out of 24 subjects were correctly classified. NLD low achievers were identified by decision rules as NLD. That is, 18 out of 20 NLD subjects were correctly classified (see Table 1).

NLD identification

Subjects were classified as NLD if they did not fit derived decision rule criteria for LD classification and were designated by the institution as eligible for the school's remedial education program (achieving below grade 6 in reading).

Creating the Subject Pool

Prior to beginning treatment, all institution identified LD delinquents as well as low-achieving NLD delinquents, with at least 5 months sentence time left, were summoned to the auditorium and informed by the researcher of the opportunity to participate in a problem solving class being offered by a local university. The researcher read aloud the consent form (see Appendix B) and explained that two

Table 1

Contingency Table of Agreements and Disagreements Between Decision Rule and Institution Identification of LD and NLD Delinquents

		Institution Identified	
		LD	NLD
Decision Rule Identified	LD	92% 22 agreement	10% 2 disagreement
	NLD	8% 2 disagreement	90% 18 agreement

different types of classes would be taught but that all classes concerned problem solving for real-life situations.

Delinquents were told that participation in the class would earn them a certificate of completion. Delinquents were assured that there would be no penality if they chose not to volunteer. At this initial orientation and sign-up meeting, subjects were told that there would not be enough room for everyone to participate and that selection would be made on a random basis. Subjects who wished to participate were given a consent form to sign. Altogether, 168 subjects were called in and presented with the opportunity to volunteer for the program. Approximately 19% were non-volunteers. These non-volunteers did not appear to be systematically different from volunteers. The primary reason given for not volunteering was not wishing to miss vocational training classes or other special classes which occurred at the same time as the problem solving class.

Those delinquents who signed consent forms (N = 136) comprised the volunteer subject pool. From this volunteer pool, 78 delinquents (57%) were classified as NLD and 44 delinquents (43%) were classified as LD according to prescribed decision rules. Of the 24 volunteer subjects already identified by the institution as LD, 21 were similarly classified LD by the decision rules. The 3 institutionally identified LD subjects who were classified as NLD according to the decision rules were assigned to the NLD subject pool. That is, all subjects were classified according to decision rule criteria.

Assignment to Groups

The LD and NLD subjects were independently randomly assigned to research groups. Before assigning delinquents to groups, an attempt was made to control for residential influences from the institution's nine living units. Additionally, because treatment was very language oriented and some dependent variables were measurements of oral responses, an attempt was made to control for language skill as measured by the Peabody Picture Vocabulary Test (PPVT).

Therefore, LD and NLD volunteer delinquents (i.e., treated separately) were subgrouped according to residential living unit and then rank ordered within their subgroup according to a PPVT age equivalent derived score. Delinquents were then randomly assigned to research conditions while controlling for PPVT rank and cottage across groups.

Subjects were assigned to one of three research conditions: full treatment group, attention control group or test-only control group. All groups experienced some attrition during the first few weeks of training. Reasons for attrition were not systematic and were essentially the same across all groups. These reasons included transfer to another institution or conflicting program schedules. Additionally, four participants were dropped from the study at the outset, two LD treatment and two LD test only subjects, because they had been placed on security "lockdown" status just prior to treatment and remained on this status during the entire program.

The Final Sample

The final research sample was 69 institutionalized delinquents, 34 LD and 35 NLD, from the high school population of a California youth corrections institution. Table 2 presents demographic data for this sample. For LD subjects (a) average chronological age was 17 1/2 years (SD = 1.15 years); (b) average language age was 11 years (SD = 3.37 years); (c) average number of behavior reports at two weeks pre treatment was 3 (SD = 2.81); (d) average number of convictions prior to incarceration was 2 (SD = 1.95); and (e) average length of sentence was slightly more than 2 years (SD = 1.15 years). There were 26 females and 8 males in LD groups. There were 27 LD delinquents of minority races and 7 of the white race.

For NLD subjects (a) average chronological age was 18 1/2 years (SD = 1.14 years); (b) average language age was 11 years (SD = 2.10 years); (c) average number of behavior reports at two weeks pre treatment was 1 1/2 (SD = 1.56); (d) average number of convictions prior to incarceration was 2 (SD = 1.99); and (e) average length of sentence was slightly more than 2 years (SD = .96 years). There were 19 females and 16 males in NLD groups. There were 24 NLD delinquents of minority races and 11 of the white race.

Using a MANOVA analysis, LD groups did not differ on mean chronological age, PPVT age, race, sex or number of behavioral incident reports recorded during the two weeks prior to treatment. Similarly, there were no differences between NLD groups on these variables.

Table 2

Means and Standard Deviations of Demographic Data for LD and NLD Groups

Group	n	Sex		Race[a]		PPVT[b]		Age		Behavior reports[c]		# of prior convictions		length of sentence[d]	
		m	f	min.	wt.	M	SD	M	SD	M	SD	M	SD	M	SD
Learning Disabled*															
Treatment	12	4	8	8	4	12.37	2.62	17.97	0.63	3.08	2.94				
Attention-Control	11	1	10	11	0	10.04	2.76	17.12	0.81	3.27	2.28				
Test-only Control	11	3	8	9	2	10.36	2.43	17.61	1.09	2.36	2.69				
LD	34	8	26	28	6	10.97	2.37	17.58	1.15	2.91	2.61	2.03	1.95	2.32	1.15
Non—Learning Disabled*															
Treatment	14	7	7	10	4	10.91	1.78	18.51	1.22	1.57	1.65				
Attention-Control	12	6	6	7	5	11.58	2.33	18.38	1.12	1.42	1.93				
Test-only Control	9	3	6	7	2	11.68	2.36	18.45	1.16	1.50	1.12				
NLD	35	16	19	24	11	11.34	2.10	18.45	1.14	1.50	1.56	2.14	1.99	2.20	0.96

*MANOVA found no significant differences between groups

[a] Number of subjects for minority or white

[b] Peabody Picture Vocabulary Test: language age in years

[c] Number of behavior reports for 15 days prior to treatment

[d] Sentence length in years

Setting

Approximately 500 youths comprised the total population of high school students within the institution. The institution is located in Southern California and is unique because it houses female as well as male youthful offenders. The institution was otherwise typical of state youth facilities, incarcerating the most "hard core" of adjudicated youth. Taken together, state facilities house approximately 44% of California's incarcerated delinquents (California Almanac 1984, Note 5). Youth placed in a state facility, which served as the setting for this research, have committed very serious offenses, have a long history of convictions, or are considered security risks.

Design

The overall design required a random assignment to treatment and control groups. Random assignment control group designs reduce potentially significant threats to internal validity such as history, selection, maturation and statistical regression (Campbell & Stanley, 1963).

However cognitive training research has been criticised for not adequately controlling such unwanted sources of variance (Butler & Meichenbaum, 1981; Camp et al., 1977; Little & Kendall, 1979). This investigation addressed those concerns. Moreover, within a closed setting, such as a correctional institution, it is critical to control for effects due to attention and/or novelty. Such a control was provided by having LD and NLD attention control groups receive an alternative treatment with similar interpersonal contact and for the same length of time as the experimental treatment groups. The alternative treatment consisted of problem solving training in daily living skills such as consumer math, health, geography and career education.

A posttest only control group design was used to measure cognitive dependent variables (e.g., self-efficacy, cognitive solution generation, self-assessment). A posttest only design for these measures was decided upon because the disadvantages of pretest bias, personnel time and costs outweighed any advantage of increased sensitivity to treatment effects which a pre-post comparison might provide.

However, a pretest-posttest control group design was used to assess overt behavior of social adjustment (e.g., number of behavior reports, good days credit, staff ratings). Pre-post comparisons were planned for these variables because detection of overt behavior change within the institution related to cognitive treatment required the most sensitive design and procedures possible. In this regard Campbell & Stanley (1963) stated, for example, that gain score differences are more sensitive to effects of treatment than posttest only measures.

Additionally, Reppucci & Clingempeel (1978), in their review of methodological issues in research with correctional populations, have suggested that effects of trainer personality and institutional atmosphere be controlled as threats to internal validity. Institutional atmosphere was held constant by drawing all subjects from one institution and by having treatment and control groups begin and end at the same time. Consequently, pre and posttesting took place within the same time frame for all subjects. Moreover, further threats to internal validity from sources of experimenter bias were reduced by disqualifying the researcher as trainer. Trainer personality was held constant by having the same teacher-trainer for LD treatment and attention control groups and the same teacher-trainer for NLD treatment and attention control groups.

Thus the design of this research reflected relevant methodological criticisms published over the last five years and includes provisions intended to correct methodological inadequacies of previous work.

Measurement of Dependent Variables

Conceptual Framework

Cone (1978) proposed a conceptual framework and taxonomy for assessing behavior. The behavior assessment grid identifies three main dimensions: *channels* (motor, cognitive, physiologic), *methods* (indirect-interview, self report, ratings by others, direct role play, naturalistic free behavior, self observation) and *universe of generalization* (scores, items, settings, methods, contexts, time). The dependent variable measures of this investigation were constructed to represent the framework of Cone's assessment grid.

One purpose of this investigation was to assess the degree of generalisation of training. Therefore, Cone's assessment grid was used to conceptualise a spectrum of dependent variables each more distant from the training. For example, two channels of behavior, cognitive and social, were assessed. Several methods of measurement such as self-report, interview, ratings by others and naturalistic observation were used. Lastly, taken together the measures represented a continuum of generality from training task, context and response domain.

Cognitive measures of social adjustment included meta-awareness of relevant social variables, perceptions of self-efficacy, cognitive problem solving skills of solution generation and social meta-self-assessment of social competence. *Overt behavior* measures of social adjustment included number of behavior reports, amount of good days credit, phase promotions and staff ratings of treatment goal progress. These measures of dependent variables are discussed in the following sub-sections beginning with the most proximal generalization measure to the most distal. Figure 3 illustrates dependent variables construed in a generalization continuum.

Blind Evaluations

Students were not aware that the project was a research study. They did not know that they would be tested on cognitive variables at termination of treatment. Treatment and attention control subjects all thought they were participating in a problem solving thinking class. Test-only subjects thought they were on a waiting list for a thinking skills class. All subjects were informed of the purpose of the problem solving class after the study was completed.

In terms of overt behavior measures, staff members did not know that behavior report, phase standings, good days or treatment goal ratings would be used as research measures; therefore, integrity of these measures was protected. Similarly, delinquents did not know that they would be evaluated or that behavior reports or case conference reports were going to be used to measure their behavior.

Moreover, staff raters performed behavior ratings independently of each other and were blind as to which group the delinquent being rated belonged. Staff members

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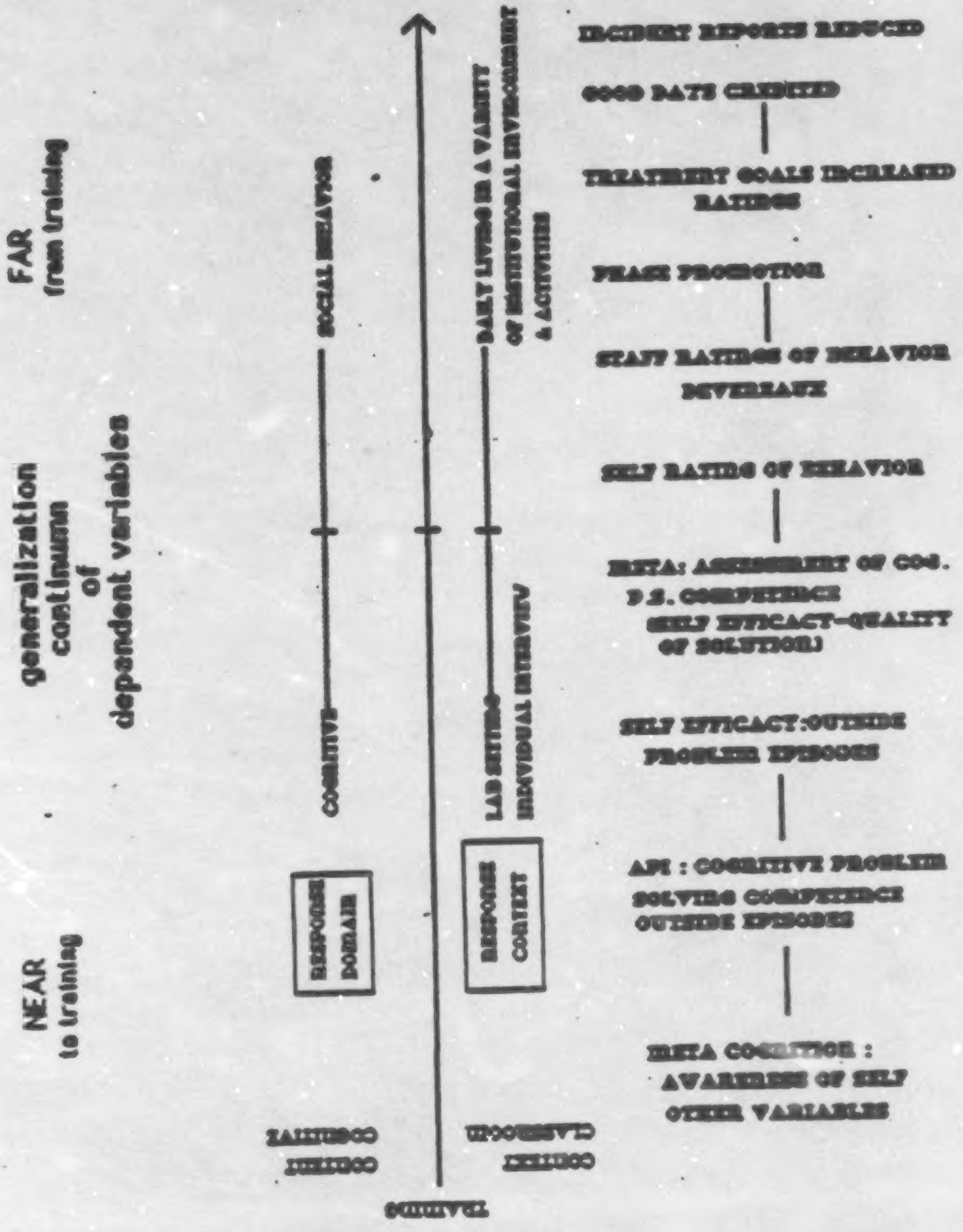
Figure 3


FAR
(from training)
generalization continuum of dependent variables
NEAR
to training
RESPONSE DOMAIN
COGNITIVE
SOCIAL BEHAVIOR
RESPONSE CONTEXT
LAB SETTING
INDIVIDUAL INTERVIEW
DAILY LIVING IN A VARIETY OF INSTITUTIONAL ENVIRONMENT & ACTIVITIES
COGNITIVE CONTEXT
CLASSROOM CONTEXT
TRAINING
INCIDENT REPORTS REDUCED
GOOD DAYS CREDITED
TREATMENT GOALS INCREASED RATINGS
PHASE PROMOTION
STAFF RATINGS OF BEHAVIOR DEVEREAUX
SELF RATING OF BEHAVIOR
META: ASSESSMENT OF COG. P S. COMPETENCE (SELF EFFICACY-QUALITY OF SOLUTION)
SELF EFFICACY:OUTSIDE PROBLEM EPISODES
API : COGNITIVE PROBLEM SOLVING COMPETENCE OUTSIDE EPISODES
META COGNITION : AWARENESS OF SELF OTHER VARIABLES

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were told not to inform delinquents that they were being rated and to keep rating protocols confidential and secure.

Cognitive Measures

Social meta-awareness measures. Social meta-awareness was assessed for several reasons. First, it is a salient piece of evidence for inferring that meta-cognition mediates overt social adjustment. That is, demonstrating that both meta-awareness and overt social behavior improve as a consequence of training allows the inference that meta-cognition mediates overt behavior. Secondly, meta-awareness was assessed because it was closely aligned to the training curriculum, consequently representing a more "near" cognitive generalisation than the API problem solving inventory or self-efficacy scale in terms of training context, task and response domain. Some generalisation for meta-awareness was required, however, since the interviewer and interview environment were different from training rooms and one week had passed since training. Additionally, interviewers made no mention of the training class and "played dumb" if any subject mentioned the training class. The third reason for measuring meta-awareness is that many investigators, such as Butler and Meichenbaum (1981), Meichenbaum (1981) and Flavell (1979), have spoken of the potential relevancy of meta-cognition to social adjustment. Moreover, it was postulated that delinquents manifest meta-cognitive deficiencies. By assessing the test-only control groups' meta-cognitive skills, it was possible to test this hypothesis.

One week after treatment had terminated, all delinquents were individually interviewed. Several adults, posing as staff from a central corrections office in

Sacramento, informed students they were conducting surveys on student opinions regarding social problem solving. Delinquents were also told that their names would not be taken and all opinions would be kept confidential because "the department" was not interested in specific delinquent opinions but rather a survey of all student opinions. Subjects were also informed that there were no "right" answers to questions. All subjects agreed to be interviewed.

All subject responses were tape recorded. Interviewers were special education doctoral students. Interviewers were trained for two hours in how to establish rapport, how to maintain security, how to present the task, how to prompt and how to operate recording equipment.

Delinquents were asked three questions one at a time.

Question 1: "If you were having a problem with another person or other people and you wanted to solve that problem in the best way, what information or facts would you want to find out about **yourself** in order to solve the problem in the best way?"

Question 2: "What information or facts would you want to find out about or know about the **other person** or people to solve the problem in the best way?"

Question 3: "What information or facts about the **situation** in general would you want to know or find out about to solve the problem in the best way?"

Prompting was done in a standard fashion. If the delinquent did not respond or appeared confused about the question, the interviewer repeated the question using a visual cue. The visual cue was created by having the interviewer draw two small circles on a piece of paper while telling the delinquent that one circle represented them and one circle represented the person they were having a problem with. Then, while pointing to the appropriate circle, the interviewer would repeat the question. Almost every delinquent required a visual prompt. After being given a visual prompt all delinquents were able to understand the question and respond. After answering the question once, each subject was asked once more if there was anything else they should be aware of or know about. At this repeat of the question, the visual cue was presented to those subjects who had not yet been visually prompted. The interviewer went on to the next question when the subject indicated they had no more to say.

Scoring was accomplished by having one rater listen to taped subject responses. Using a protocol which listed cognitive meta-awareness variables, the rater simply checked off when a variable was mentioned by the delinquent (see Tables 4 and 5 for variables). Each delinquent's meta score was total number of variables mentioned.

Inter-rater reliability was calculated by randomly selecting 25% of subjects and having another rater listen to and mark protocols. An agreement was tabulated each time the two raters scored a response in the same way (i.e., in the same category). Thus inter-rater agreement was computed by dividing the number of agreements between the first and second rater by the total number of scored responses indicated by the first rater.

Adolescent Problem Inventory (API). When assessed cognitive skills are similar to training tasks, generalization is not far from training. Because skills similar to training are assessed on the API tasks, this measure is closer to training tasks and domain than is the self-efficacy measure. However, for examining degree of generalization, the API is appropriate because problem episodes on the API are not similar to problem episodes used during the training, thus some degree of generalization is required. The API episodes have to do with typical problems occurring in the community or on the "streets" (see Appendix D) while the training curriculum episodes were specifically restricted to typical problems occurring within the institution. During training sessions, in order to assure that performance on the API required some degree of generalization of the trained skills, no reference was made to "outside" problems. Teachers did not permit subjects to discuss "outside" problems.

The API is a 44 item cognitive problem solving measure assessing quality of generated solutions to hypothetical problems. The inventory was empirically developed to reflect the problems which delinquents have the most difficulty in handling effectively. The API has shown both concurrent and discriminant validity (Freedman et al., 1978). In one study the API discriminated between institutionalized delinquents and two non-delinquent populations (good citizens and leaders). A second study discriminated between two subgroups of institutionalized delinquents; males with acting out problems were judged to respond less skillfully than males who had few acting out problems. The API is reported to be reliable, to lack any strong, coherent or interpretable item structure and to be an unusually strong predictor of group membership.

Furthermore, the API provides relevant social problem episodes (Freedman et al., 1978). Social problem episodes represented on the API were culled from experiences of a large number of delinquents. Relevancy of problem situations is an important criteria according to D'Zurilla and Goldfried's (1969) "behavior analytic model" which suggests identifying test stimuli which are relevant to actual experiences of the subject.

Butler and Meichenbaum have strongly urged that the issue of typical performance be kept clearly in mind when deciding upon test format. These researchers concluded that ability performance is dependent upon the degree of problem solving "set" created by the structure and procedures of the test administration. In turn problem solving set is maximized when the problem solver is clearly aware that solutions which would solve the problem are being requested.

Similarly, Hopper (1978) has spoken of *limit testing* vs. *spontaneous performance* when assessing alternative thinking. Limit testing, asking subjects to generate as many solutions as possible, was significantly related to social competence as measured by teacher rating and peer nomination. Conversely, spontaneous performance, asking subjects for one solution, was not related to adjustment. Therefore, ability testing and limit testing procedures were followed in administering the API.

Moreover, researchers have found both quantity (Spivack & Shure, 1976) and quality (Camp et al., 1977; Hopper, 1978) of generated solutions to be related to social adjustment. Therefore, both quality and quantity of responses were evaluated.

During the first and second week after treatment was terminated, the API was individually administered to all delinquents. Test procedures were standardized and followed guidelines in the API manual. Interviewers were trained for three hours on how to establish rapport, how to maintain security, how to administer the test and how to operate equipment.

All delinquent responses were tape recorded. Delinquents were informed that a survey was being taken on how delinquents solved problems and that their responses would remain confidential. Delinquents were also told that there was no "right" answer or "right" solution to the problems. All subjects agree to participate in the interview.

Subjects were read nine hypothetical problem episodes one at a time. After hearing each problem episode, the delinquents were asked "Tell me in your exact words what you would do or say now to solve this problem." After giving a solution, the subject was asked "is there anything else you could do or say to solve this problem?" In order to avoid influencing the quality of delinquent's solutions, the interviewer remarked "good, you thought of something else" each time the student presented a solution. The interviewer continued to ask delinquents for additional solutions until each delinquent indicated twice that they couldn't think of any more solutions. Then the interviewer went on to the next problem episode.

Scoring for quantity was accomplished by counting the number of solutions each subject generated per episode and taking an average quantity over all episodes. Scoring for quality was accomplished by using the criterion referenced raters manual which gave a 5-point Likert-type scale with example answers for each level of quality. One trained rater blind to subject groups did all ratings for all delinquent solutions. The rater was given a packet of typed delinquent responses, for each problem episode. The delinquent's responses were randomly ordered, across all subjects.

Inter—rater reliability was calculated by randomly selecting 25% of the subjects and having a second trained rater independently rate quality of responses according to the manual. Agreement was calculated by counting number of agreements between raters for competent and incompetent quality ratings on each solution divided between total numbers of overall solutions.

Self-efficacy. Perceived self-efficacy is concerned with self-evaluations of one's capability to perform given activities. Assessment of self-efficacy was determine to be relevant because the strength, magnitude and generality of behavior change has been found to be influenced by self efficacy (Bandura & Adams, 1977; Bandura et al.; 1977). Bandura (1977) and Schunk (1981) both found that self efficacy accounted for most of the variance in predicting future performance. Perceived self efficacy has been proposed as the cognitive mechanism underlying all behavior change (Bandura; 1977; 1978).

Moreover, self-efficacy is postulated to have motivating effects by influencing an individual's effort expenditure and persistence in the face of difficulty. Examining trainings' effectiveness in enhancing self-efficacy was important because predicting future performance, effort and persistence are important constructs in the interpersonal domain. Furthermore, Allen et al. (1976) found that cognitive problem solving training enhanced self-efficacy in preadolescent students. Butler and Meichenbaum (1981) have strongly urged that self efficacy be examined as a dependent variable in interpersonal cognitive problem solving.

Although self-efficacy is an affective/cognitive behavior, it is essentially unrelated to skills practiced in cognitive training. Moreover, because self-efficacy problems were different from problems practiced in training, any influence training may have had on self-efficacy was considered a "far" generalization within the cognitive domain.

During the last training session, trainers administered a self-efficacy test to treatment and attention control groups. LD and NLD test-only subjects were tested in two groups the following day. Self-efficacy was assessed following procedures outlined by Bandura (1977), Schunk (1981) and Keyser and Barling (1981). Each trainer read aloud 9 problem situations from the API test manual. For each problem episode, subjects were asked to judge their capability to solve the problem well. The trainers asked subjects, "How sure do you feel you could solve the problem without making matters worse?". Subjects marked a Likert-type scale for each episode. The scale was divided into segments ranging from 0 to 100 with verbal descriptors occurring at the 10th, 40th, 70th and 100th position (see Appendix D).

Scoring was accomplished by calculating an average self-efficacy score for each subject over all 15 episodes. Self-efficacy for each episode was also calculated.

Overt Behavior Adjustment Measures

Subject self-ratings. One week after training was terminated, treatment and attention control groups were asked to complete anonymous questionnaires about helpfulness of the class and about their own social behavior. Delinquents were told that ratings would help trainers make the class better for the future and that honest opinions were very much wanted. Trainers read aloud rating questions while the subjects marked a 7-point Likert scale (see Table 16, Chapter 4). *Scoring* was calculated for each group by finding the average rating for each question.

Behavior rating scale. With regard to a cognitive training program, behavior ratings of overt social behavior are one method of measuring generalization of trained skills to different contexts and response domains. However, because behavior ratings are indirect and measure perception of behavior rather than actual behavior, there is always the danger of measuring perceptions of the rater more than characteristics of the one being rated. Thus evidence for generalization or mediation of behavior is not as strong with behavior rating data as with measures of actual behavior. Correspondence between staff ratings and actual student behavior can be calculated post hoc and interpretation of data made accordingly. Nevertheless, behavior ratings are accepted measurement tools in social science research and have a legitimate role if used as one of multiple measures of behavior.

The Devereaux Adolescent Rating Scale (1969) was used to measure social adjustment. The scale is designed to profile 12 problem factors (see Appendix D). Jesness (1978), in Buro's Personality Tests, reported that the scales' reliability, validity and inter-rater agreement are quite adequate.

During the week prior to training and during the week following training, each delinquent was rated by two residential unit staff. Staff raters were selected by living unit director on the basis of their familiarity with students and their general ability to perform a rating task. For each unit, one of the two raters was a "senior" staff member and one rater was a "junior" staff member.

A *composite score* was calculated by taking the average of the two raters' scores on each rated item. Thus each subject had a composite score for each of the 12 factor items. Two of the living units, involving about 12 delinquents in the study, had only one rater because the other rater had either transferred or been hospitalized at post test.

Measures of overt social behavior. Overt social behavior is very far removed from the training task, context and response domain and thus implies maximum generalization of training skills. Changes in overt social adjustment, attributable to the treatment, supply strong evidence for mediational capacities of cognition. Routine recording of actual behavior represents a very concrete and objective method of assessing actual behavior, albeit human subjectivity can never be removed from any measurement of social behavior. Thus, to assess degree of generalization of trained skills, institutional recordings of actual behavior appeared to be the clearest method for measuring behavior far removed from training task, context and response domain.

Institutional procedures provided several naturalistic evaluations. Number of behavior incident reports recorded for each delinquent, monthly achievement for each student on their institutional phase level, increase in good days credit (e.g., time deducted from commitment sentence) and staff rated progress toward institution designated treatment goals were selected as overt dependent variable measures. All of these measures involved routine institutional procedures and thus have a great deal of ecological validity with regard to social functioning. Furthermore, because behavior reports and phase level each measured student functioning across a variety of institutional environments and activities and because both measures were derived from judgements of a variety of staff of staff, the probability of measuring meaningful social change was good.

All delinquents participated in the institution's phase program. Phase level was determined each month at individual case conferences. Delinquent privileges and degree of freedom within the institution were determined by what phase level the delinquent had earned. Phase level was a composite rating of each delinquent's progress toward treatment goals, behavior on the living unit, attitude toward peers and authority, degree of participation in institutional programs and school grades. The ratings were done by the youth counselor, senior staff member and parole officer and were averaged to arrive at the points which determined the phase level earned.

Behavior reports were made by all institutional staff members (i.e., teachers, security guards, living unit personnel and administrators). Behavior reports were made regarding rule infractions and such acts as refusal to follow staff instructions, acts of physical or extreme verbal aggression and possession of contraband. These incidents were recorded on a daily basis and delinquents were permitted to appeal each report. Reports dismissed on appeal were not counted in this investigation.

Procedures

Trainers

Prior to beginning the research project, each teacher-trainer had 25 hours of instruction and practice with lesson plans, materials and techniques developed by the researcher. Following this inservice training, and one month before the study was to begin, both teachers taught the complete curriculum with a pilot group of delinquents from the same institution who did not participate in the study. One teacher worked exclusively with LD treatment and attention control groups; a second teacher worked exclusively with NLD treatment and attention control groups.

The Training Class

Each training class was integrated into the institution's normal school program. Delinquents in both treatment and attention control groups met separately three times a week as part of their high school curriculum. Subject participants were excused from their high school classes and came to either the treatment or attention control problem solving class on a regular schedule. Trainers were called teachers and all school rules applied during the training project.

Curriculum Training Components

The treatment program was divided into three components: *verbal self-instruction* (VSI), *social meta-cognition* (META) and *problem solving processes* (PSP). The training schedule for treatment consisted of 22 one and a half hour sessions over a 7 week period. Approximate treatment breakdown was planned to consist of 3 sessions for VSI, 9 sessions for META and 10 sessions for PSP (see Appendix E).

In order to maximise generalisation of training, Meichenbaum (1979), Stokes and Baer (1977) and Meichenbaum and Asarnow (1979) suggested the following principles: (1) trainers should explicitly tell subjects the value of skills being taught and how to use skills outside of training sessions, (2) trainers should remind subjects to use skills taught and discuss briefly at each session the subject's application of skills outside of the training context, and (3) training problems should be similar to problems outside of the training sessions. These recommendations comprised the general framework for designing and conducting training. Moreover, the researcher monitored all sessions to assure that the lesson plans were being followed as specified. Appendix F presents a sample lesson plan and posters.

In general, training activities consisted of trainer and subjects reading aloud and following lesson plans distributed to each delinquent. Each lesson was organized around large cartoon-like posters, which served to focus discussion and attention. Lesson plans presented an orderly sequence of cognitive thinking skills or concepts, provided groups with questions for discussion as well as activities for drill, review and practice.

Social problem scenarios or episodes were also presented daily and delinquents practiced applying newly learned skills to simulated problem. The problem scenarios were generated by institution staff and delinquent college level students prior to the beginning of the project and thus represented relevant and recognizable problem situations. Group activities consisted of the following general sequence: (a) reading the lesson plans outloud, (b) discussing concept questions, (c) sharing experiences in applying the skills, (d) drill of steps and procedures, (e) participant modeling, and (f) self grading of how well one was applying the skills learned.

Verbal self instruction (VSI). This treatment component taught delinquents to covertly cue themselves to stop and think before responding in a social "risk" situation where impulsive responding might cause harm, danger or illegal behavior. The *VSI* component provided delinquents with a method for obtaining initial impulse control. Instruction included review and reminders about situations requiring impulse control, discussion, modeling, drill on use of covert cues, and covert practice on simulated problems read aloud by teachers. Each delinquent created their own covert cue, such as "hold it" or "wait up", and wrote it in a notebook. During each session delinquents orally evaluated how well they were controlling first impulses in problematic situations around the institution.

Social meta–cognition (*META*). This treatment component taught delinquents what to think about. *META* provided the delinquents with methods for locating and labeling salient features of interpersonal problem situations. Salient features of the interpersonal problem situation consist of both "*self*" and "*other*" variables. Finally, subjects were taught how to evaluate the usefulness of available information as a means of assessing problem difficulty.

Delinquents were specifically taught to assess "*self*" variables by asking the following questions. Delinquents were also taught to "read" or identify the relevant cues which provide answers to the following questions.

a. What's my emotional level? Is my anger under control?

b. Do I feel confident in handling this situation?

c. What did I do in the past to solve this kind of problem? Did it work?

d. How good am I with this kind of problem?

e. How hard will I work for a good solution?

f. Is this problem important to me? Should I just forget it?

g. What do I want in this situation? What's my goal?

h. Am I willing to modify what I want? Will I compromise?

i. What's my status in this situation? What's my role or power?

The delinquents were also taught to read cues to provide answers to the following question pertaining to relevant "*other*" variables within the social problem.

a. How many people are involved?

b. What's the emotional level of the other(s)? Are they rational? Do I need to leave them alone for the moment?

c. What does the other think is the problem? What's their point of view?

d. How does the other feel? What emotions are they feeling?

e. Does the other care about solving the problem?

f. What does the other want out of the situation? What's their goal?

g. Is their goal similar to or different from my goal?

h. Would they be willing to compromise?

i. What am I to them? How do they feel about me as a person?

Taken together, these skills comprised the delinquent's META knowledge.

Problem solving process (*PSP*). This treatment component taught the delinquents how to think. Delinquents were taught a general strategy for effectively using social meta-cognitive information gathered by identification and assessment of situational information. Specifically they were taught to to select or create adaptive solutions to perceived problems. Delinquents were taught not only to produce adaptive responses (i.e., solutions) but also to use meta-knowledge to monitor and evaluate the feedback received after solutions are implemented. The *PSP* component had 8 steps:

1. **State the problem:** Using the salient meta information, accurately identify the conflict, remember long-term life goals and specify short term goals which do not hurt the long term goals.
2. **Make plans:** Generate as many solutions as possible which fulfill your own and others short term goals, but which do not hurt your long term goals.
3. **Pick the best:** For each potential solution, predict who will be affected by the action and who will react to the action. Consider pros and cons for yourself and other people involved. Pick the best solution in terms of trade-offs of pros and cons.
4. **Be prepared:** Anticipate opportunities and obstacles associated with the chosen solution and plan how to solve them. Specify the step by step process needed to implement the solution. Select a back-up solution in case of problems.
5. **Take action:** Execute as planned. Don't give up in the face of ridicule or frustration.
6. **Check it out:** Evaluate reactions to your solution by assessing the meta-variables for any changes. Decide if the goal is satisfactorily met. If the goal is not met, try the back-up or go back to step 2.

Control Groups

Attention control group. LD and NLD attention control groups met on the same days as their treatment group counterparts. Attention control groups met for the same amount of time as treatment groups. The purpose of attention control groups was to rule out effects due to novelty, contact with "outside" adults and special group membership. Therefore, these groups were provided with an interesting and relevant problem solving curriculum focused on solving general living skill tasks, including career awareness, job interviewing, political perspectives, consumer education and money management, geography and map reading, reading comprehension, law related education, and drivers education. Specific activities for LD attention control group were modifications of the NLD activities because LD delinquents required somewhat more structured activities than their NLD counterparts. However, both groups were given the same general kinds of tasks and content.

Test–only control group. After randomly assigning groups, test-only subjects were informed that there had not been enough room for them in the class. They were also told that the institution itself might conduct future classes and that they would be allowed to take the class at that time. Indeed, three months after the project terminated, some of the institution's school teachers were trained to conduct the treatment class and the high school instituted two problem solving classes.

Research personnel never interacted with test-only control subjects during the treatment phase. After treatment terminated, test-only control subjects were tested and interviewed in the same manner as treatment and attention control subjects.

Maintaining Subject Participation

Subject attendance was encouraged by providing coffee and donuts once each week and by making certificate of completion contingent upon no more than one absence without make-up. In order to assure equal attention, both attention control and treatment subjects, when absent from a session, were given make-up sessions at their residential unit. Trainers or the researcher would give make-up lessons. None of the delinquents were absent more than 4 times and make-up lessons were always given. Average absences before make-ups were: LD treatment (M = .58, SD = 1.08); NLD treatment (M = 1.75, SD = 1.56); LD attention control (M = 2.09, SD = 1.76); and NLD attention control (M = 1.0, SD = 1.04).

CHAPTER 4

Results

Analysis By Group

Research purposes attempting to identify specific generalization effects required separate analysis for each variable. Moreover, there was not empirical or theoretical evidence for relating various dependent variables in a linear combination. Therefore, these research concerns prevented organizing data into an overall multivariate analysis of variance (MANOVA). Instead each dependent variable was individually analyzed using ANOVA procedures with considerations for Type I error made within each dependent variable analysis.

Analysis By Individual Subject

In testing for main effects, analyses of group means using ANOVA procedures were augmented with procedures examining individual subjects. That is, calculating and comparing proportions of individual subjects within each group who showed specifically defined behaviors. Thus, ANOVA procedures analyzes scores while individual subject procedures analyzes proportions of subjects. There were several reasons for examining treatment effects at the individual level. First, measuring effects at the individual subject level had practical significance for inferences about training with regard to measuring if individual subjects actually changed in some meaningful way. Second, these data were more interpretable by examining individual subject performance given the high variance between and within groups on dependent measures. Third, small sample size permitted individual outlying scores to wash out differences between groups. Finally, individual subject analysis uniquely addressed important questions such as: "How many subjects in each group improved?" or "How many subjects in each group scored above or below a specific point?" Therefore, on most of the dependent measures, both group comparisons and individual subject comparisons were made.

Multiple Regression Analysis

A multiple regression analysis was used to extend this investigation's concern with generalization by examining generalizability of effects to the population. In support of this approach, Shapiro (1984) pointed out how regression can be used to answer questions about external validity. Appendix G presents a note on regression analysis and its use in examining external validity and theoretical speculations.

Separate Analysis for LD/NLD

LD and NLD groups were analyzed separately because trainer personality and treatment group peer influences could not be held constant between these groups during training. Moreover, design and subject selection procedures purposely differentiated these groups on ability characteristics; therefore, direct comparisons were inappropriate because it was untenable to assume that these groups had equal means on dependent variables prior to treatment.

Attrition

The total number of cases in each group varied slightly from analysis to analysis because of occasional missing data not available within the institution and because it was not possible to posttest two subjects on one of the dependent variables. However, no single subject was missing data on all dependent variable measures. Therefore, all subjects from each group were included in most analyses. In fact, on cognitive variables, no more than one subject for any group was missing. In these cases, subjects were not posttested because they were ill or scheduled for parole board appointments or off grounds when testing was conducted. With regard to overt behavior measures, no more than two subjects for any group were missing. In these cases, data was missing from institutional files either because subjects had transferred from one living unit to another or files had been misplaced. Missing cases for each dependent variable were randomly distributed among all groups and in equal proportion in all groups. Appendix H presents number of missing cases by group for each dependent variable measure.

Dependent Variables

Presentation of results is organized in terms of sub-problems and hypotheses. Dependent variables for each hypothesis are presented in order of expected degree of generalization from training — from the most proximal to the most distal from training. Figure 3 depicts this continuum of generalization of dependent variables.

Sub-problem 1

To determine the degree of generalization effects across different contexts and behavioral domains.

Hypothesis

LD and NLD treatment groups, as compared to their attention and test-only control groups, will show significant effects on both cognitive and overt behavior measures.

Social Meta-Awareness

Each subject's meta-awareness score represented the quantity of meta variables identified as important to problem solving. Meta-cognition (meta-self and meta-other) was analysed using a two-factor analysis of variance procedure with repeated measures within subjects on one factor. Levels on the repeated measure factor were meta-self and meta-other. Levels on the between factor were treatment, attention control and test-only groups. Table 3 presents LD and NLD meta-awareness means and standard deviations.

Analysis of variance. Results for LD delinquents showed statistically significant differences between LD treatment, attention and test-only groups ($F(2,29) = 43.44$, $p < .00001$) in quantity of meta-awareness variables identified. Additionally, statistically significant differences were found on the repeated measure ($F(1,29) = 13.02$, $p < .0011$) with meta-other variables identified more frequently than meta-self variables. There was no significant interaction effect between group and level of

Table 3

Means and Standard Deviations on Quantity of Meta-Cognitive Variables Identified as Important to Social Problem-Solving

	Meta-Cognitive Variables	
	Self[a]	Other[b]
Learning Disabled		
Treatment		
n	11	11
M	2.727	3.909
SD	1.489	1.640
Attention Control		
n	11	11
M	.182	.636
SD	.405	.505
Test-only Control		
n	10	10
M	.100	.500
SD	.316	.707
Non-Learning Disabled		
Treatment		
n	14	14
M	1.071	4.214
SD	.829	1.188
Attention Control		
n	12	12
M	.333	1.583
SD	.492	1.165
Test-Only Control		
n	9	9
M	.111	.866
SD	.333	.500

[a] LD > controls <.000; NLD > controls <.000

[b] LD > controls <.000; NLD > controls <.005.

meta-awareness. Post hoc pair-wise t-tests between groups were performed for each repeated factor. This post hoc analysis indicated LD treatment identified more meta-other and meta-self variables than either attention ($t_{(29)} = 7.09$, $p < .00001$; $t_{(29)} = 6.47$, $p < .00001$) or test-only ($t_{(29)} = 7.21$, $p < .00001$; $t_{(29)} = 6.51$, $p < .00001$) groups. There were no statistically significant differences between LD control groups on total meta-awareness variables identified.

Results for NLD subjects were similar. Statistically significant differences in quantity of meta-awareness variables identified were found between NLD treatment, attention and test-only groups and on the repeated measure, ($F(2,32) = 44.50$, $p < .00001$; $F(1,32) = 61.16$, $p < .00001$, respectively) with meta-other variables again identified more frequently than meta-self variables. A significant interaction effect was found between group and meta-awareness, ($F(2,32) = 14.21$, $p < .00001$). The interaction effect showed that NLD treatment delinquents identified relatively more "other" variables than "self" variables in relation to control groups.

Post hoc t-tests indicated NLD treatment group identified more meta-other and meta-self variables than either attention ($t_{(32)} = 6.37$, $p < .00001$; $t_{(32)} = 3.00$, $p < .0051$) or test-only ($t_{(32)} = 7.91$, $p < .00001$; $t_{(32} = 3.60$, $p < .0011$) groups. There were no significant differences between NLD control groups on total meta-self or meta-other variables identified.

Multiple regression analysis. A multiple regression analysis was performed to determine proportional contribution of treatment to the explained variance in meta-awareness. Thus, this analysis provided data for examining external validity and determining if treatment was able to explain meta-awareness over and beyond influences of other variables (see Appendix G). For regression analysis purposes, meta-awareness was a summed composite of meta-self and meta-other scores. Treatment was entered last into the regression equation. A step-wise procedure permitted the relative effect of treatment compared to sex, race and PPVT age.

For LD delinquents, treatment contributed 65% of the explained variance in meta-awareness ($t_{(31)} = -9.74$, $p < .000$). Table 4 presents proportion of variance accounted for by other variables. The total variance explained by all four variables was 81% ($F(4,27) = 29.54$, $p < .00001$). LD treatment group continued to contribute 65% of the explained variance in meta-cognition even when relative to sex, race, PPVT age, number of prior convictions, severity of committing offense and gang affiliation ($t_{(27)} = -9.07$, $p < .0001$). These seven variables explained 84% of the total variance in LD meta-awareness ($F(7,20) = 15.09$, $p < .00001$).

For NLD subjects, treatment contributed 61% of the explained variance in meta-awareness when entered last in the equation after sex, race and PPVT age ($t_{(34)}$, $p < .0001$). Table 4 presents proportion of variance accounted for by these other variables. Approximately 72% of the total variance was accounted for by all 4 variables ($F(4,30) = 19.85$, $p < .000$). Treatment contributed 58% of the explained variance for the NLD treatment group beyond effects of sex, race, PPVT age, number of prior convictions, severity of offense and gang affiliation ($t_{(28)}$, $p < .0001$). These seven variables explained 79% of the total variance in NLD meta-awareness ($F(7,21) = 11.25$, $p < .00001$).

Descriptive analysis. Tables 5 and 6 present a descriptive analysis of the kind of meta-awareness variables identified by LD and NLD subjects as well as the propor-

Table 4

Proportion of Delinquents Identifying Meta–Other Variables

Variable	Group					
	Treatment		Attention-Control		Test-Only Control	
Meta Other	LD n=12	NLD n=14	LD n=11	NLD n=12	LD n=11	NLD n=8
Complexity of problem	-	.36	0	.17	0	0
Social context	.27	.50	0	-	0	0
Emotional level	.45	.57	.27	.33	.17	-
Cognitive perspective	.45	.64	.27	.67	.17	.25
Affective perspective	.36	.71	0	-	-	.25
Motivation level	.55	.29	-	-	-	-
Desired goals	.36	.50	0	0	0	0
Goal comparison	.55	.14	0	0	0	0
Willingness to compromise	.73	.50	0	-	0	0
Relationship to other	.18	.36	0	-	0	0

Note. A dash (-) indicates that one delinquent identified the variable. A zero (0) indicates that no delinquents identified the variable.

Table 5

Proportion of Delinquents Identifying Meta–Self Variables

Variable	Group					
	Treatment		Attention Control		Test-Only Control	
Meta-Self	LD	NLD	LD	NLD	LD	NLD
	n=12	n=14	n=11	n=12	n=11	n=8
Emotional level	.55	.36	.18	.17	-	0
Self confidence	-	0	0	0	0	-
Experience	.36	-	0	0	0	0
Kind of past solutions	.18	0	0	0	0	0
Success of past solutions	0	0	0	0	0	0
Motivation level	.45	.36	0	0	0	0
Expertise with problem	.18	0	0	0	0	0
Desired goals	.55	.29	0	0	0	0
Willingness to compromise	-	-	0	0	0	0
Role status	.27	0	0	0	0	0

Note. A dash (-) indicates that one delinquent identified the variable. A zero (0) indicates that no delinquents identified the variable.

Table 6

Proportion of Variance Accounted for in Meta-Awareness with Treatment, Demographic and Personal History Variables

Regression Variable	Contribution to R^2	
I[a]	LD n=34	NLD n=35
sex	.040*	.018
race	.015	.008
PPVT	.016	.000
treatment	.653**	.612**
II[b]		
sex	.045*	.000
race	.005	.014
PPVT	.008	.002
severity of offense	.003	.001
# of prior convictions	.002	.025
gang affiliation	.038*	.000
treatment	.654**	.577**

Note. Treatment variable entered last in regression equations. The contribution to R^2 for each variable is the amount by which R^2 would be reduced if that variable were removed from the regression equation.

[a] Regression equation had 4 variables

[b] Regression equation had 7 variables

* $p < .05$ } on individual t-tests

** $p < .001$ } on individual t-tests tion of subjects in each group who identified that variable. Inter-rater agreement (as reported in Chapter 3 under scoring of API) for kind of meta-other variables identified was .90 for LD and .95 for NLD groups and for kind of meta-self variables identified .98 for both LD and NLD groups.

Quantity of Solutions: *Adolescent Problem Inventory* (*API*)

Delinquents had been asked to generate as many solutions as they could to nine hypothetical social problems. Quantity of solutions over all nine problems was summed for each delinquent to derive a total-solution score. Table 7 presents means and standard deviations of LD and NLD groups on total-solution scores.

Analysis of variance. To determine whether treatment subjects generated more solutions, on the average, over all problems than were generated by control subjects, group means were compared on total-solution scores using a one-way analysis of variance procedure. For LD subjects, results of an ANOVA yielded no statistically significant differences among treatment, attention, and test-only groups on number of solutions generated ($F(2,32) = .244$, $p < .79$). For NLD subjects, the ANOVA showed that treatment students generated more solutions than attention or test-only groups, a difference which was statistically significant at the .11 level ($F(2,32) = 2.38$). Post hoc individual, one-tailed t-tests indicated NLD treatment subjects generated more solutions than attention ($t_{(32)} = 1.48$, $p < .075$) and test-only ($t_{(32)} = 2.07$, $p < .025$) groups.

Analysis by individual subject. Although NLD group averages were similar, analysis by individual subject would show if proportionally more treatment subjects,

Table 7

Means and Standard Deviations for the Total Number of Solutions Generated for Nine Hypothetical Problems

Groups	Number of Solutions
Learning Disabled	
Treatment	
n	12
M	1.87
SD	0.56
Attention Control	
n	11
M	2.00
SD	0.63
Test-only Control	
n	11
M	2.06
SD	0.82
Non—Learning Disabled	
Treatment	
n	14
M	2.45
SD	1.27
Attention Control	
n	12
M	1.94
SD	0.45
Test-Only Control	
n	9
M	1.68
SD	0.42

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than control subjects, generated high numbers of solutions across more social problem situations. There were no empirical or theoretical reasons for selecting a specific quantity as the score which differentiated high solution generators from low generators. Therefore, the score at the 75%tile rank for quantity of solutions generated was used as a cut-off score to identify high solution generators.

Results clearly demonstrated that more delinquents in NLD treatment group were higher solution generators. The NLD treatment group had the greatest proportion of high solution generators on 6 out of 15 problem situations as compared to attention group which had the greatest proportion of high solution generators on only one problem situation. Furthermore, the test-only group always had a smaller proportion of high solution generators than either treatment or attention control groups. Table 8 presents proportion of NLD delinquents who fell at or above the 75% rank in quantity of solution generation. For LD delinquents, analysis of proportions yielded results that were consistent with ANOVA results. No meaningful differences between treatment and LD control groups were found on any of the nine problem situations.

Quality of Solutions: *Adolescent Problem Inventory* (*API*)

Solutions were analyzed to determine the impact of training on quality of cognitive social problem solving under the assumption that it is more meaningful to evaluate competence on a situation by situation basis than by collapsing all problem situations in a single score. Clearly, the reasonableness of collapsing situations depends upon the similarity of the problem situations.

Moreover, a situation by situation analysis does not necessarily preclude making

Table 8

Proportion of NLD Students at or Above the 75% Rank for Quantity of Solutions Generated for Each Problem Solution

		Problem Situations								
NLD Group	n	1	2	3	4	5	6	7	8	9
Treatment	14	.50*	.57*	.43*	.50*	.43*	.64	.29*	.57*	.50
Attention Control	12	.25	.50	.33	.42	.17	.42	.33	.42	.58*
Test-Only Control	8	0	.50	.25	0	.25	.63	.13	.25	.13

*Group with highest proportion of delinquents at or above 75% rank inferences about overall competence. Inferences regarding overall competence follow from McFall's (1982) assumption that "the greater number of inventory areas in which a person shows incompetence, the greater the risk that the person will experience difficulty in real life" (p. 21). The inverse of this assumption would predict that the greater the number of problem situations in which a person shows competence, the greater the probability of exhibiting competence in real life.

Authors of the *API* report a lack of consistent clustering of problem situations and they further state that problem situations were specifically designed to be non-overlapping in their content. Therefore, the most meaningful approach to analyzing *API* data was determined to be a situation by situation analysis.

As described in Chapter 3, each solution was given a quality rating by an independent rater using a criterion referenced manual. Ratings were 0 or 2 (clearly incompetent), 4 (between competent and incompetent), and 6 or 8 (clearly competent). Two forms of data were used for analysis. Average Quality was defined as the average quality rating for solutions of a given problem. Average Quality permitted analysis of the competence of an individual's repertoire of solutions. That, is every solution generated was included as an indicator of competence. Best Quality was defined as the highest rating assigned to any solution. Best Quality measured an individual's maximum ability to generate competent solutions as opposed to a measure of typical performance.

Analysis of variance. Average Quality for treatment and control groups was compared using a one-way ANOVA for each of the nine problem situations. The criterion level for statistical significance on a single set was set at .006. This would maintain the experimentwise Type I error at .05 over all nine ANOVAs. Using this conservative criterion level, there were no statistically significant differences between groups in either the LD or NLD categories. Table 9 presents LD and NLD group means and standard deviations on Average Quality of solutions. For LD subjects, Best Quality was compared between groups using a one-way ANOVA for each problem situation. As in previous ANOVA, considerations for Type I error across all ANOVA procedures required a criterion level of .006 for statistical significance. Using this criterion level there was no statistically significant difference on Best Quality between LD groups. Table 10 presents means and standard deviations of Best Quality solutions. The ANOVA analyses for NLD groups showed that treatment had a statistically significant higher Best Quality mean than attention and test-only groups on problem #8 ($F(2,32) = 6.88$, $p < .003$). One-tailed post hoc t-tests showed treatment delinquents to be superior to attention and test-only control groups ($t_{(32)} = 2.16$, $p < .018$ and $t_{(32)} = 3.65$, $p < .0009$) on Best Quality.

Individual Subject Analysis. Over and above average group performance, were a greater proportion of delinquents in the treatment group generally more competent in terms of cognitive problem solving? Analysis of quality of solutions at the individual subject level addressed this question. Individual subject analysis was accomplished by rating each subject as either an incompetent or competent problem solver. Delinquents were rated incompetent if they had generated more incompetent solutions (solutions rated 0 or 2) than competent. They were rated competent if they had generated more competent solutions (solutions rated 6 or 8) than incompetent. The proportion of incompetent and competent problem solvers for each group is

Table 9

Means and Standard Deviations of Average Quality of Solutions Generated for Nine Problem Situations

		Problem Situations								
Group	n	1	$2^{a,b}$	3^{c}	4	5	6	7	8^{d}	9
Learning Disabled										
Treatment	12									
M		3.6	3.6	5.2	2.6	4.1	4.7	6.3	4.1	4.6
SD		1.9	1.5	2.6	2.6	1.8	2.3	1.9	2.2	2.0
Attention-Control	11									
M		3.9	3.1	2.6	4.3	4.3	3.8	5.6	2.3	4.8
SD		1.8	1.7	1.9	2.1	1.1	2.7	1.9	1.4	2.3
Test-Only Control	11									
M		4.4	2.8	3.4	4.0	3.5	5.5	6.1	2.5	4.3
SD		1.9	1.2	2.5	3.3	1.5	2.0	1.6	2.0	2.5
Non—Learning Disabled										
Treatment	14									
M		3.7	4.5	3.8	4.1	3.6	4.3	5.8	3.8	5.0
SD		2.5	1.6	1.5	2.1	1.3	1.8	1.7	1.8	1.6
Attention-Control	12									
M		4.4	4.2	5.0	4.3	3.4	4.7	6.4	2.6	5.4
SD		2.0	1.1	2.0	2.2	1.1	2.7	1.3	1.7	1.9
Test-Only Control	9									
M		4.9	3.4	2.5	4.4	3.5	4.9	5.7	1.8	4.0
SD		1.8	0.9	2.6	3.2	1.4	2.2	1.7	1.2	2.5

[a] LD > attention $p<.01$; LD > test-only $p<.09$

[b] NLD > test-only $p<.03$

[c] LD > attention $p<.02$; LD > test-only $p<.04$

[d] NLD > attention $p<.05$; NLD > test-only $p<.01$

Table 10

Means and Standard Deviations of Best Quality of Solutions Generated for Nine Problem Situations

Group	n	Problem Situations 1	2[a,b]	3[c]	4	5	6	7	8[d]	9
Learning Disabled										
Treatment	12									
M		5.5	4.1	6.0	3.5	4.6	5.8	7.1	4.5	6.0
SD		2.9	2.0	3.0	3.0	1.7	2.3	1.3	2.2	2.2
Attention-Control	11									
M		5.4	3.6	3.3	5.4	4.7	4.7	6.7	3.2	5.1
SD		2.7	1.9	2.5	2.5	1.0	3.1	1.6	2.0	2.6
Test-Only Control	11									
M		5.2	2.4	4.9	4.9	4.3	6.5	7.2	2.7	5.2
SD		2.4	0.9	3.2	3.7	1.7	1.6	1.0	2.4	2.7
Non—Learning Disabled										
Treatment	14									
M		5.0	5.1	5.3	5.6	4.6	5.6	7.0	4.6	6.6
SD		3.2	1.5	2.5	2.2	1.4	2.1	1.7	1.4	1.9
Attention-Control	12									
M		5.5	4.5	6.2	5.6	5.1	5.8	7.3	3.1	6.8
SD		2.6	1.5	2.1	1.9	1.6	3.2	1.3	2.0	1.8
Test-Only Control	9									
M		6.2	3.7	3.7	4.9	4.0	5.8	6.2	2.0	5.5
SD		2.3	0.6	3.4	3.3	1.7	2.5	1.8	1.4	3.1

[a] NLD > attention $p<.02$; NLD > test-only $p<.15$

[b] LD > attention $p<.10$; LD > test-only $p<.02$

[c] NLD > attention $p<.02$; NLD > test-only $p<.001$

[d] LD > attention $p<.10$; LD > test-only $p<.04$

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presented in Table 11.

The LD subjects, when compared to LD attention and test-only control subjects, had better quality solutions. LD treatment groups had about the same proportion of competent problem solvers as LD control groups; however, LD treatment groups had clearly fewer incompetent problem solvers than LD control groups.

Individual subject analysis did not support the tendency for NLD delinquents in the treatment group to have better quality solutions. In fact, NLD attention control delinquents were more often competent and less often incompetent problem solvers than either NLD treatment or test-only control delinquents.

Descriptive analysis. Average Quality scores did not evaluate a subject's tendency to be competent (i.e., most frequent competence level) for solution generation. Analysis of modal quality would measure competence tendency. However, there were too few solutions generated per subject to meaningfully measure a modal score. Therefore, general tendencies of competence and incompetence were analysed by comparing groups on proportion of competent and incompetent means.

Evidence of the LD treatment group to exhibit a general tendency of the NLD treatment group tendency to produce better Average Quality solutions was supported by finding that LD treatment group had a greater proportion of group means of competent quality. In 4 out of 9 problem situations, LD treatment group means were of competent quality (i.e., at or above a 4.5 rating). However, in only 2 out of 9 problem situations were attention or test-only group means of competent quality. Moreover, LD treatment group exhibited a general tendency to produce fewer incompetence solutions. The LD treatment group had only one problem situation in which the group

Table 11

Proportion of Delinquents in Each Group
Rated as Competent or Incompetent Problem Solvers

Group	n	Problem Solvers	
		Competent[a]	Incompetent[b]
Learning Disabled			
Treatment	12	.64	.17
Attention-Control	11	.45	.55
Test-only Control	11	.64	.36
Non-Learning Disabled			
Treatment	13	.54	.31
Attention Control	12	.77	.16
Test-only Control	9	.33	.56

[a] Rated as competent if majority of solutions were competent
[b] Rated as incompetent if majority of solutions were incompetent

mean was of incompetent quality rating (i.e., at or below a 3.5 rating); yet attention had incompetent group means on 3 problem situations and test-only had incompetent group means on 4 problem situations.

A general tendency of the NLD treatment group to produce fewer incompetent (i.e., at or below a 3.5 rating) solutions was similarly evident. NLD treatment group had no incompetent group means while attention had incompetent means on 2 problem situations and test-only had incompetent means on 4 problem situations. The NLD groups were essentially equivalent on general tendency to produce competent solutions (i.e., at or above a 4.5 rating), with NLD treatment having 3 competent group means and attention and test-only having 4 competent group means.

The LD treatment group exhibited a general tendency to produce more Best Quality solutions of competent quality (i.e., at or above a 5.5 rating). LD treatment group had 5 out of 9 competent group Best Quality means while attention had only 1 competent Best Quality group means and test-only had only 2 competent Best Quality group means. There were essentially no differences between NLD groups when making comparisons on tendency to generate competent Best Quality solutions. The NLD treatment group had 4 out of 9 competent group Best Quality means while attention had 6 competent group Best Quality means and test-only had 4 competent group Best Quality means.

Self-efficacy

Analysis of variance. Delinquents rated themselves for self-efficacy on fifteen specific problem situations. Because ratings represented multiple measures of self-efficacy for a variety of community situated social problems, these values were aggregated to represent a delinquent's general social self-efficacy (see Appendix C). Table 12 presents means and standard deviations for LD and NLD on general social self-efficacy.

For LD subjects, ANOVA yielded no statistically significant difference between treatment and control groups on general self-efficacy ($F(2,30) = 1.61$, $p < .22$). Similarly, for NLD subjects, ANOVA found no statistically significant difference between treatment and control groups on general self-efficacy ($F(2,32) = .43$, $p < .65$).

Analysis by individual subject. The existence of large within group variance may indicate that small between group differences, if they occurred, could not be detected. Therefore, additional analyses were conducted to determine if more delinquents in the treatment group were high in self-efficacy compared to delinquents in control groups. There were no empirical or theoretical reasons for selecting a specific self-efficacy value to represent "high" self-efficacy for this particular population. Therefore, "high" self-efficacy was considered to be that value, over all groups, at or above the 75%tile rank. Once again, individual subject analysis was deemed to be a more meaningful procedure by which to analyse data that were distorted by large variability within groups. Analysis was accomplished by determining, for each problem situation, the proportion of subjects in each group who were at or above the 75%tile on self-efficacy value. Table 13 presents the proportion of subjects in each group at or above the 75%tile rank on each problem situation. The LD treatment group had far fewer subjects who obtained high self-efficacy scores compared to attention or test-only control groups. Indeed, on 6 out of 15 problem situations, LD

Table 12

Means and Standard Deviations for General Self–Efficacy

Group	Self-Efficacy
Learning Disabled	
Treatment	
n	12
M	73.54
SD	12.78
Attention Control	
n	11
M	72.24
SD	14.64
Test-only Control	
n	10
M	61.03
SD	20.81
Non—Learning Disabled	
Treatment	
n	14
M	75.71
SD	11.34
Attention Control	
n	12
M	75.88
SD	12.22
Test-Only Control	
n	9
M	71.77
SD	9.35

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Table 13

Proportion of Delinquents at or Above the 75% Rank for Self-Efficacy Ratings for each Problem Solution

	Problem Situations															
Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	M[a]
Learning Disabled																
Treatment	.33	.36*	.42*	.17*	.33	.08*	.25	.33	.25	.58	.50	.17*	.08*	.33	.50*	.29
Attention Control	.36	.45	.73	.27	.36	.45	.09*	.64	.36	.64	.55	.45	.27	.18*	.81	.44
Test-Only Control	.09*	.18	.55	.36	.36	.18	.45	.27	.18	.45*	.27*	.37	.36	.27	.64	.34
Non—Learning Disabled																
Treatment	.21*	.36	.21	.21*	.71	.36	.21*	.50	.29	.43	.50	.36*	.43	.29	.71	.38
Attention Control	.33	.25	.25	.50	.42	.50	.42	.50	.42	.50	.66	.92	.42	.17*	.83	.47
Test-Only Control	.33	.11*	.44	.33	.44	.11*	.67	.11*	.22	.44	.56	.44	.22*	.33	.67	.36

---

*Group with lowest proportion of delinquents at 75% rank

[a] M = Average proportion of delinquents at or above 75% rank

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treatment group had a smaller proportion of subjects than attention or test-only groups at or above the 75%tlie rank, while LD attention and test-only control had a smaller proportion of subjects on only 1 problem situation.

A similar pattern of lowered self-efficacy scores was found with the NLD treatment group. NLD treatment had a smaller proportion of delinquents at the 75%tile tank on 4 self-efficacy problem situations while NLD attention control had a smaller proportion of delinquents on only 1 problem situation and test-only on 3 problem situations.

Multiple regression analysis. Given that self-efficacy can reasonably be expected to be influenced by personal history and social status a multiple regression analysis was performed to determine what factors had contributed to variance in self-efficacy. A step-wise procedure permitted the relative effect of treatment compared to sex, race and PPVT age.

For LD subjects, sex accounted for the largest proportion of explained variance (i.e., 22%, $t_{(32)} = 2.26$, $p < .007$) and these four variables explained 27% of the total variance in LD self-efficacy ($F(4,28) = 2.54$, $p < .06$). See Table 14 for the proportion of variance accounted for by these four variables.

An additional regression analysis was performed to determine if personal history attributes were greatly impacting self-efficacy; making treatment influences more difficult. Therefore, the relative effects of treatment were measured compared to sex, race, PPVT age, number of prior convictions, severity of offense and gang affiliation. Sex (12%, $t_{(32)} = 2.26$, $p < .03$) remained an important factor but gang affiliation accounted for the most variance with 15% ($t_{(32)} = 2.62$, $p < .02$). These

Table 14

Proportion of Variance Accounted for in Self-Efficacy with Treatment, Demographic and Personal History Variables

Regression Variable	Contribution to R^2	
	LD	NLD
I[a]	n=34	n=35
sex	.218**	.014
race	.001	.003
PPVT	.000	.012
treatment	.013	.006
II[b]		
sex	.115*	.019
race	.001	.003
PPVT	.004	.010
severity of offense	.001	.003
# of prior convictions	.000	.007
gang affiliation	.154*	.000
treatment	.023	.009

Note. Treatment variable entered last in regression equations. The contribution to R^2 for each variable is the amount by which R^2 would be reduced if that variable were removed from the regression equation.

[a] Regression equation had 4 variables

[b] Regression equation had 7 variables

* $p<.05$ } on individual t-tests

** $p<.001$ } on individual t-tests

seven variables explained 44% of the total variance in LD self-efficacy ($F(7,25) = 2.78$, $p < .03$). Table 15 presents proportional contributions of each variable.

For NLD delinquents, descriptive variables explained little of the variance in self-efficacy. The four variables of sex, race, PPVT age and treatment explained less than 1% of the total variance in NLD self-efficacy ($F(4,30) = .40$, $p < .81$). Table 14 presents proportional contributions of each variable. Moreover, when personal history variables were added to the equation these seven variables explained less than 1% of the total variance in NLD self-efficacy ($F(7,27) = .30$, $p < .95$).

Meta-Awareness of Personal Ability

Self-efficacy, as measured in this investigation, was essentially a self-appraisal of problem solving ability as delinquents were asked "How sure do you feel that you could solve this problem without making matters worse?"

For six problem situations it was possible to correlate each delinquent's self-efficacy score and Best Quality (i.e., highest rated score) in the API. For LD and NLD groups there was essentially no correlation between self-efficacy and quality of solution. Indeed some of the groups had negative correlations. Table 15 presents correlations by group.

Sub-problem 2

To determine whether the proposed training program is effective in enhancing overt social behavior of LD and NLD juvenile delinquents.

Table 15

Correlations Between Perceptions of Self–Efficacy and Best Quality of Solution[a] for Six Hypothetical Social Problem Solutions

Group	n	Problem Situations 1	2	3	4	5	6
Learning Disabled							
Treatment	12	-.07	-.03	.31	.68**	.28	.06
Attention-Control	11	-.05	.07	.01	.30	-.25	.03
Test-only Control	10	.63*	-.08	.21	.31	.41	.14
Non–Learning Disabled							
Treatment	14	-.50	.20	-.20	-.35	-.30	-.33
Attention-Control	12	-.41	.62*	-.27	-.03	-.22	-.13
Test-only Control	9	-.12	-.47	.26	.38	.00	.71*

[a] Best Quality solution rated by independent judge according to API criterion-referenced raters manual.

*$p<.05$ } on individual t-tests

**$p<.01$ } on individual t-tests

Hypothesis

LD and NLD treatment groups will perform significantly better than either the LD and NLD attention or test-only control groups on overt dependent variables.

Self-Ratings of Behavior

Treatment and attention control group delinquents completed an anonymous questionnaire eliciting evaluations of their problem solving class and their social behavior. Groups were compared on seven questions. Table 16 presents the questionnaire and group means and standard deviations. It was not appropriate to do a Hotelling T^2 analysis for the seven questions because a specific subject's responses from question to question were not recorded. Therefore, multiple t-tests were performed and experimentwise Type I error was controlled across all seven tests with an .05 alpha level by using an individual test criterion of .007

LD treatment and attention control subjects both highly recommended their respective classes to other institution delinquents. Absence of statistically significant difference on this question further suggests that the attention control group received an equivalent experience in terms of subjects' interest, motivation and satisfaction. There was a definite trend for subjects in the LD treatment group to rate remaining questions higher than LD attention control subjects. LD treatment subjects rated question #2 (i.e., "I know how to solve problems better since taking this class") statistically significantly higher ($t_{(23)} = 1.96$, $p < .001$). Additionally, LD treatment subjects rated questions #3-7 higher ($t_{(20)} = 2.01$, $p < .035$, $t_{(24)} = 2.32$, $p < .014$, $t_{(24)} = 1.85$, $p < .035$, $t_{(23)} = 1.96$, $p < .026$, $t_{(24)} = 2.54$, $p < .008$) than LD

Table 16

Means and Standard Deviations for Anonymous Questionnaires Rated by Subjects

Questions	Groups							
	Treatment				Attention-Control			
	LD n=14		NLD n=15		LD n=11		NLD n=11	
	M	SD	M	SD	M	SD	M	SD
I would recommend this class to other YA students.	6.13	1.41	6.60	0.83	6.27	1.85	6.18	1.17
I know how to solve problems better since taking this class[b,d].	6.13	.92	6.67	.72	3.54	2.62	5.55	1.21
I can control my temper better now[c].	6.00	1.04	6.07	1.39	4.30	2.71	5.72	1.56
What I learned in this class I can use at (name of institution)[a,d].	6.33	.48	6.53	.74	4.81	2.27	5.73	1.27
What I learned in this class I can use outside the institution[c].	6.67	1.11	6.53	.83	5.36	2.42	6.45	.82
I get along better now than before I took this class[a,c].	5.71	1.38	5.87	1.36	4.18	2.48	4.73	1.56
Others have told me I seem to get along better now[d].	5.67	1.40	5.06	1.95	3.82	2.32	5.09	2.12

[a] $p<.05$ [b] $p<.01$ } for NLD
[c] $p<.05$ [d] $p<.01$ } for LD

attention control subjects.

Similarly, NLD treatment and attention control groups were equally positive about their respective classes. NLD treatment means on self-ratings were generally higher than attention control. NLD treatment subjects rated question #2 with statistically significant higher scores ($t_{(24)} = 2.98$, $p < .003$) than attention control subjects and also rated questions #4 (i.e., What I learned in this class I can use at the institution.") and #6 (i.e., "I get along better now than before I took this class.") higher than attention control subjects ($t_{(24)} = 2.03$, $p < .025$; $t_{(24)} = 1.99$, $p < .035$).

Devereaux Behavior Rating Scale

Analysis by individual subject. The Devereaux pre and post ratings by institution staff focused on perceived improvements of subjects. Analysis of proportions of individual subjects was again selected as most appropriate for estimating practical treatment effects. Pre-post ratings for each delinquent on each behavior factor were compared and each delinquent was rated as *improved, no change* or *worsened.* Appendix I presents normed means and standard deviations for the Devereaux protocol.

Subjects were rated as *no change* on specific Devereaux factors if pre and post ratings were within the normal range of 1 standard deviation (+/—) of the normed mean. Subjects were rated as *improved* on a behavioral factor if (a) pre-post comparisons showed changes in ratings within one standard deviation of the mean to *below* one standard deviation from the mean, or (b) pre-post comparisons showed changes in rating from above one standard deviation of the mean to any score closer to the mean. Students were rated as *worsened* on a behavioral factor if (a) pre-post comparisons showed changes in ratings from within one standard deviation of the mean to more than one standard deviation above the mean, or (b) pre-post comparisons of ratings showed changes from above one standard deviation of the mean to a score further from the mean.

When the preceding analysis was conducted, each delinquent had a rating of *improved, no change* or *worsened* on each of 12 Devereaux behavior factors. These 12 ratings were used to rate each delinquent overall as having improved, not changed or worsened in their behavior as perceived by staff. Delinquents were rated *improved* if they had improved on 7 or more factors. They were rated as "no change" if an equal number of factors were improved and worse. They were rated as "worse" if they were worse on 7 or more factors (see Table 17).

For LD subjects, the treatment group had a greater proportion of subjects rated improved (55%) than either attention (18%) or test-only control (44%) students. A more dramatic difference was in the proportion of subjects who got worse. LD treatment had far fewer subjects rated worse (18%) than either attention (45%) or test-only (44%) groups.

However, for NLD, the attention group had a greater proportion of subjects rated improved (58%) than either treatment (33%) or test-only (29%) groups. NLD attention also had a smaller proportion of subjects rated worse (8%) than either treatment (17%) or test-only (29%) groups.

Table 17

Proportion of Delinquents Rated as Improved[a] or Worsened[b] According to Pre–Post Comparsions of Devereaux Behavior Rating Scale

Group	n	Proportion	
		Improved Delinquents[a]	Worsened Delinquents[b]
Learning Disabled			
Treatment	11	.55	.18
Attention-Control	11	.18	.45
Test-only Control	9	.44	.44
Non–Learning Disabled			
Treatment	12	.33	.17
Attention-control	12	.58	.08
Test-only Control	7	.29	.29

[a] Improved = if delinquent had improved on 7 or more factors

[b] Worsened = if delinquent had worsened on 7 or more factors

Institutional Behavior Reports

Actual behavior, administratively reported by institutional staff, was analyzed for each subject in the study. Negative behavior incidents were written up and filed by staff each day as a routine institutional procedure. Groups were analyzed by comparing proportion of delinquents who had improved behavior reports from pre to posttesting periods.

To diminish the arbitrariness that potentially exists in a penal facility with regard to behavior reports, only delinquents whose quantity of filed reports was decreased by 2 or more were counted as improved. Given that 1 report per week was the average received by all subjects prior to treatment, a reduction of 2 or more reports was assumed to more reflect an actual, rather than an arbitrary, improvement in social adjustment within the institution.

Some delinquents in each group had a perfect record of no behavior reports at pretesting periods. Was maintaining a perfect record an indication of a positive treatment effect? This question was answered by determining how likely it was for the institutionalized delinquent to maintain a perfect record of zero behavior reports. The probability of having maintained a perfect record was calculated for each group.

Indeed, it was determined that keeping a perfect record at post testing was highly unlikely for the entire LD sample taken as a whole ($p = .38$) and similarly for the entire NLD sample ($p = .56$). Treatment subjects, on the other hand, had a significantly greater probability of maintaining a perfect record (LD = .50; NLD $p = 1.0$, see Table 18). Thus, maintaining perfect records of no administrative reports was not random but more likely a result of systematic influences positively associated

Table 18

Probability of Maintaining Zero Behavior Reports from Pre to Post Testing Periods at One Week and Two Weeks

Group	Probability One Week[a]	 Two Weeks[b]
Learning Disabled		
Treatment	.75	.50
Test-only Control	.60	.25
Over all LD Groups	.67	.38
Non-Learning Disabled		
Treatment	1.00	1.00
Attention Control	.17	.25
Test-only Control	zero	zero
Over all NLD Groups	.45	.56

Note. LD attention control had no delinquents with zero reports at pretesting

[a] 8 days pre and post

[b] 15 days pre and post

with treatment. These subjects who had maintained a perfect record were considered to have demonstrated behavior improvement.

Analysis by individual subject. Proportion of delinquents in each group who improved on behavior reports were compared. Due to small sample size, a nonparametric procedure was used to test homogeneity of proportions (Marascuilo & McSweeney, 1977).

For LD students, treatment delinquents demonstrated clear and consistently superior effects on behavior reports than did either attention or test-only control delinquents. Table 19 presents proportions of subjects in each LD group who improved on behavior reports. The LD treatment group showed a clear superiority in having a greater proportion of subjects with improvement on behavior reports. Even with a small sample size statistically superior improvement at the .05 level for LD treatment group was found at one week pre-post testing periods ($X^2 = 7.16$, df = 2). The NLD treatment group also showed a clear superiority in having a greater proportion of delinquents with improvement on behavior reports compared to attention and test-only groups. (see Table 19). Again, with a small sample size, statistically significant greater proportions ($X^2 = 10.368$, df = 2, $p < .01$) of improved delinquents were found for the treatment group compared to controls.

By combining the LD and NLD groups and thus increasing the sample size, statistically significant differences at the .05 level were found favoring treatment over control group delinquents at one week ($X^2 = 7.27$, df = 2, $p < .05$) and two week ($X^2 = 8.25$, df = 2, $p < .05$) pre-post testing periods (see Table 20).

Multiple regression analysis. A multiple regression analysis was performed to

Table 19

Proportion of Students in Each Group Who Improved[a] on Behavior Reports from Pre to Post Treatment

Group	n	Proportion	
		One Week[b]	Two Weeks[c]
Learning Disabled			
Treatment	11	.73	.55
Attention-Control	11	.27	.18
Test-only Control	12	.25	.25
Non-Learning Disabled			
Treatment	14	.43	.57
Attention-Control	12	.25	.25
Test-only Control	7	.14	.14

[a] Improved defined as (1) reducing behavior reports or (2) maintaining zero reports from pre to post treatment

[b] 8 days pre and post

[c] 15 days pre and post

Table 20

Proportion of Delinquents (combining LD and NLD Categories) Who Improved[a] on Behavior Reports From Pre to Post Treatment

		Proportion	
Group	n	One Week[b]	Two Weeks[c]
Treatment	25	.56*	.56**
Attention-Control	23	.26	.22
Test-only Control	19	.21	.21

[a] Improved defined as (1) reducing behavior reports or (2) maintaining zero reports from pre to post treatment

[b] 8 days pre and post

[c] 15 days pre and post

* Treatment > attention and test-only control $p<.05$

** Treatment > test-only control $p<.05$

determine if treatment increased explained variance of improvement in behavior reports relative to other variables such as social status and personal history which can be expected to influence behavior. Additionally a step-wise procedure permitted the relative effect of treatment compared to sex, race, and PPVT age.

For LD subjects, treatment accounted for 10% ($t_{(32)} = 1.79$, $p < .084$) of the explained variance in behavior report improvement. Table 21 presents proportions of variance accounted for in behavior improvement. These four variables explained 11% of the total variance in LD behavior report improvement ($F(4,28) = .86$, $p < .50$). The relative effect of treatment accounted for 5% of the variance ($t_{(32)} = 1.36$, $p < .19$) compared to personal history and social status variables of sex, race, PPVT age, number of prior convictions, severity of offense and gang affiliation. Gang affiliation accounted for the most variance (15%, $t_{(32)} = 2.27$, $p < .03$) in behavior improvement. Table 21 presents proportions of variance accounted for by these seven variables. These seven variables explained 28% of the total variance in LD behavior report improvement ($F(7,25) = 1.36$, $p < .26$).

For NLD subjects, treatment explained 14% ($t_{(33)} = 2.26$, $p < .03$) of the variance of improved behavior reports relative to sex, race and PPVT age. The remaining variables accounted for a negligible proportion (see Table 21). These four variables explained 18% of the total variance in NLD behavior report improvement ($F(4,29) = 1.56$, $p < .21$). Relative to sex, race, PPVT age, severity of offense, number of prior convictions and gang affiliation, treatment explained the most variance in NLD behavior improvement (14%, $t_{(33)} = 2.20$, $p < .04$, see Table 21). These seven variables explained 25% of the total variance in NLD behavior report improve-

Table 21

Proportion of Variance Accounted for in Behavior Reports with Treatment, Demographic and Personal History Variables

Regression Variable	Contribution to R^2	
I[a]	LD n=34	NLD n=35
sex	.000	.002
race	.002	.000
PPVT	.008	.019
treatment	.102*	.144**
II[b]		
sex	.010	.000
race	.000	.005
PPVT	.000	.014
severity of offense	.038	.008
# prior convictions	.018	.012
gang affiliation	.150**	.049
treatment	.054	.138**

Note. Treatment variable entered last in regression equations. The contribution to R^2 for each variable is the amount R^2 would be reduced if that variable were removed from the regression equation.

[a] Regression equation had 4 variables

[b] Regression equation had 7 variables

* $p<.05$ } on individual t-test

** $p<.001$ } on individual t-test

ment ($F(7,26) = 1.27$, $p < .31$).

Phase Level

Analysis by individual subject. Proportions of delinquent in each group who had improved in institutionally determined phase levels from pre to posttest periods were compared (Marascuilo & McSweeney, 1977).

Because some delinquent in each group were at the highest phase at pretest periods, it was important to establish if maintaining the highest phase level was random or systematic. The probability of maintaining the highest phase from pre to posttesting periods was estimated for each group. It was determined that maintaining the highest phase for the entire LD sample ($p = .57$) taken as a whole and for the entire NLD sample ($p = .63$) taken as a whole was unlikely. Probability of demotion at posttest period was much greater for attention (LD = .00; NLD = .50) and test-only (LD = .33; NLD = .00) groups compared to treatment (LD = 1.0; NLD = .33) groups. Maintenance of the highest phase demonstrated, therefore, improved social behavior relative to peers. Table 22 presents probabilities of maintaining the highest phase for each group. Proportion of delinquents in each group who had improved their phase level standing were compared. Phase level improvement was defined as: (1) promotion in phase level from pre to post or (2) maintenance of the highest phase from pre to post.

For LD delinquents, treatment showed clear superiority, as compared to attention or test-only control, in proportion of delinquents with improvement in phase level ($X^2 = 6.04$, df = 2, $p < .05$). Table 23 presents proportions of delinquents in

Table 22

Probability of Maintaining Highest Phase Level from Pre to Post Testing Periods

Group	Probability
Learning Disabled	
Treatment	1.00
Attention Control	zero
Test-only Control	.33
Over all LD Groups	.57
Non-Learning Disabled	
Treatment	.83
Attention Control	.50
Test-only Control	zero
Over all NLD Groups	.63

Table 23

Proportion of Delinquents in Each Group Who Improved[a] on Phase Level From Pre to Post Treatment

Group	n	Proportion
Learning Disabled		
Treatment	10	.70
Attention Control	10	.20
Test-only Control	10	.30
Non-Learning Disabled		
Treatment	12	.75
Attention Control	11	.27
Test-only Control	7	.29

[a] Improved = Maintained highest phase or promoted in phase

each group with improvement on phase level. Similarly, NLD subjects under treatment conditions showed marked improvement compared to control groups in proportion of subjects improved on phase level ($X^2 = 6.98$, df = 2. $p < .05$, see Table 23).

When LD and NLD groups were combined, treatment showed statistically significant superiority with regard to phase level improvement as compared to attention control ($p < .01$) and test only ($p < .05$) groups. Table 24 presents the proportion of delinquents who improved on phase level when LD and NLD groups were combined.

Behavior Report and Phase Level

Applying a more conservative and conditional criteria of social behavior improvement, treatment groups clearly demonstrated a greater proportion of improved delinquents. This analysis compared proportions of delinquents in each group who had improved on both behavior reports and phase level (see Table 25). For example, at one week post testing treatment groups (LD = 68%; NLD = 50%) showed greater proportions of subjects compared to attention (LD = 0%; NLD = 9%) and test-only (LD = 10%; NLD = 29%) who had improved on both factors.

Good Days Credited

Analysis by individual subject. Delinquents were credited with good days each month during institutional case conferences. Good days were days deducted from their term of sentence. Groups were compared, using the same nonparametric procedure previously described (Marascuilo & McSweeney, 1977), with regard to the

Table 24

Proportion of Delinquents (Combining LD and NLD Categories) Who Improved[a] on Phase Level From Pre to Post Treatment

Group	n	Proportion
Treatment	22	.73*
Attention Control	21	.24
Test-only Control	17	.29

[a] Improved = Maintained highest phase or promoted in phase

* Treatment > attention control $p<.01$; treatment > test-only control $p<.05$

Table 25

Proportion of Delinquents in Each Group Who Improved[a] on Both Behavior Reports and Phase Level

Group	n	Proportion	
		One Week[b,c]	Two Weeks[d,e]
Learning Disabled			
Treatment	10	.80	.60
Attention-Control	10	.00	.10
Test-only Control	10	.10	.10
Non-Learning Disabled			
Treatment	12	.54	.42
Attention-Control	11	.00	.09
Test-only Control	7	.29	.0

[a] Improved = reduced or maintained zero behavior reports
[b] LD Treatment > attention control $p<.01$
[c] NLD Treatment > attention control $p<.05$
[d] LD Treatment > attention control and test-only control $p<.01$
[e] NLD Treatment > test-only control $p<.05$

proportion of subjects who had increased or decreased their good days credit from pre to post periods. Some delinquents in every group had not changed the amount of their good days credit from pre to posttesting periods and were thus excluded from analysis. Therefore, to increase the sample size, LD and NLD groups were combined in this analysis.

Treatment group (8%) compared to either attention (24%) or test-only (33%) groups, showed a considerably smaller proportion of delinquents who had decreased (lost) good time credit. Treatment group (38%) also showed a considerably larger proportion of delinquents who had increased good time credit compared to attention (29%) and test-only (22%) groups. Table 26 presents the proportion of subjects in each group who had lost or gained good time credit from pre to posttesting periods.

Institutional Treatment Goal Progress

Delinquents were rated each month by an institutional committee on their progress toward treatment goals. In terms of these data, it was important to determine if more treatment delinquents, as compared to controls, were perceived as progressing toward treatment goals. Therefore, groups were compared using a nonparametric test of homogeneity of proportion (Marascuilo & McSweeney, 1977). Because of missing data in institutional files (see Appendix H) LD and NLD groups were combined to increase sample size. Treatment group (52%) showed a clearly greater proportion of delinquents, than either attention (29%) or test-only (22%) control students, who were perceived as progressing toward designated treatment goals (see Table 27).

Table 26

Proportion of Delinquents (Combining LD and NLD Categories) Who Lost or Gained Good Days[a] Credit From Pre to Post Treatment

		Proportion	
Group	n	Lost Days	Gained Days
Treatment	24	.08	.38
Attention Control	21	.24	.29
Test-only Control	18	.33	.22

[a] Good days = number of days for good behavior removed from commitment sentence time

Table 27

Proportion of Delinquents (Combining LD and NLD Categories) Who Were Rated as Progressing Toward Treatment Goals[a] from Pre to Post Treatment

Group	n	Proportion
Treatment	24	.52
Attention Control	21	.29
Test-only Control	17	.22

[a] Treatment goals = determined for each delinquent at commitment by institutional personnel and rated at monthly case conference

Sub-problem 3

To determine whether the proposed training differentially effects LD and NLD juvenile delinquents.

Hypothesis

There is no basis on which to predict how treatment will differentially effect LD and NLD treatment groups.

All of the results for analysis of each dependent variable have been presented. The LD and NLD treatment groups could not be assumed equivalent on cognitive dependent variables at pre-treatment. This assumption is supported in finding that the NLD test-only group generally had higher means on cognitive variables than the LD test-only group. However, LD and NLD groups were directly compared for pre-treatment equivalence on overt behavioral measures. Multiple t-tests were performed to compare groups on four factors: (1) average number of behavioral reports during 15 days prior to treatment, (2) proportion of subjects who had zero reports during 15 days prior to treatment, (3) average number of good days at pre-treatment and (4) proportion of subjects who were at highest phase level during pre-treatment. Table 28 presents the means and standard deviations of LD and NLD groups for these four variables.

LD delinquents had more behavior reports on the average than NLD delinquents ($t_{(67)} = 2.72$, $p < .008$). Although not statistically significant, the LD group had fewer good days credit than NLD group. The groups were essentially equivalent on proportion of students with zero reports and proportion of subjects at highest phase.

Table 28

Means and Standard Deviations of LD and NLD Groups for Behavioral Variables at the Two Weeks Pre Treatment

Group	Behavior Variables			
	Behavior Reports[a]	Zero Reports[b]	Good Days[c]	Highest Phase[d]
Learning Disabled				
n	34	33	31	32
M	2.91*	1.76	3.94	1.78
SD	2.61	.44	3.89	.42
Non–Learning Disabled				
n	35	34	32	31
M	1.50	1.74	4.72	1.74
SD	1.60	.45	3.66	.44

*LD > NLD $p < .008$

[a] Behavior reports = written reports on each delinquent for each negative incident within institution

[b] Zero reports = delinquents who received no behavior reports

[c] Good days credit = number of days, for good behavior, removed from commitment sentence

[d] Highest phase = delinquents at highest phase level (resulting in greatest number of institutional freedoms)

Meta-analysis. In addition to indirectly comparing LD and NLD treatment groups, an analysis determining magnitude of effect for each group on cognitive dependent variables was performed. Comparing magnitude of experimental effect required changing effect size into a common scale with respect to each group's population as a whole. Methods for doing this have been described by Glass and colleagues (Glass, 1976; Glass, McGaw & Smith, 1981; Kavale & Glass, 1982) and labeled as meta-analysis (see Appendix J for a note on meta-analysis). Essentially meta-analysis derives a score which is purported to represent experimental effect size (SE) in standard deviation units. Thus, LD can be compared directly to NLD in terms of magnitude of treatment effects. Table 29 lists cognitive variables and effect size for LD and NLD categories.

Table 29

Treatment Effect Size[a] for LD and NLD Treatment Groups as Compared to Test-Only Control Groups

Cognitive Variable	Group	
	LD	NLD
Meta-self	8.313	2.882
Meta-other	4.821	7.096
Self-efficacy	.574	.421
Quantity of solutions	-.230	1.840
Best Quality solutions	.321	1.242
Average Quality solutions	.300	1.000
I can control my temper better now	.627	2.180
I get along better now	.617	7.32

[a] Effect size = magnitude of treatment effect

CHAPTER 5

Discussion

Both LD and delinquent youth have been found to manifest similar cognitive social problem solving deficits (Bruno, 1981; Freedman, 1974; Hasel et al., 1982; Little & Kendall, 1979). Furthermore, there is substantial correlational data linking ineffective cognition to social maladjustment (D'Zurilla & Goldfried, 1971; Spivack et al., 1976). As previously noted, correlational data are not sufficient, however, for supporting a causal link between cognition and behavior.

This study was designed to go beyond correlational associations by investigating a hypothesis derived from a theoretical model (see Figure 1) which specifies that deficiencies in social meta-cognition increase risk for delinquency. To test this hypothesis, requires a series of investigations. First it must be shown that enhancements of meta-cognition parallels socially meaningful positive changes in behavior for a group of delinquent adolescents. This kind of evidence is critical for inferring that social meta-cognition mediates social adjustment. The empirical focus of this study addressed this issue by examining the mediational capacity of meta-cognition in enhancing overt social behavior. Additionally this study tested the mediational capacity of meta-cognition for behaviors in the cognitive domain and for LD as well as NLD delinquents.

Demonstrating the mediational capacity of cognition is insufficient, however, for concluding that meta-cognitive deficiencies cause delinquency. Instead it could be alternatively hypothesized that some process, other than meta-cognition, increases risk for delinquency while training in meta-cognition is simply a compensatory (but non-causal) skill which reduces risk for delinquency.

Therefore, building upon evidence from this study, a second investigation demonstrating that delinquents actually manifest deficiencies in meta-cognition as compared to non-delinquents is imperative. However, in this regard, this investigation does provides baseline assessment data testing meta-cognitive deficiencies of a randomly selected untreated group of delinquents (i.e., test-only control subjects). Test-only control subjects in this study supply data for preliminary conclusions concerning meta-cognitive deficiencies in delinquents.

Evidence of Meta-Cognitive Deficiencies in Delinquents

Social Meta-Awareness

Data indicated that a group of untreated delinquents had profound difficulties in identifying any kind of social meta-awareness variables. There was virtually no evidence that delinquents seek to discover factors which might affect social problem situations. For example, when asked to identify information relevant to solving social problems, most control group delinquents responded with, "What you talking about? I ain't aware of nothin' about myself (or about the other) when I have a problem. What you mean when you ask what's important to find out about myself to solve a problem? I don't know what's important to find out about!"

Furthermore, difficulty in identifying meta-awareness variables appears to characterise [illegible]-achieving delinquents, whether they are learning disabled or not, and regardless of sex, race or language ability. These status variables contributed little to explained variance in social meta-cognition. This argues that the theoretical postulates proposed in the research model have external validity for a heterogeneous population. Thus, the general application of the theoretical model to low-achieving delinquents is supported.

Delinquents had greater difficulty in identifying social meta-awareness variables about themselves than about others. Finding that delinquents are not self-aware corroborates research speculating that lack of self-awareness contributes to self-control failure (Kanfer & Karoly, 1972), prevents self-directed adaptive behavior change (Duval & Wicklund, 1972), is associated with perceptions that failure cannot be changed through behavioral adjustment (Carver, 1979), and is related to lack of generalization of newly learned skills (Kirschenbaum & Tomarken, 1982).

This evidence, that test-only delinquents had profound difficulty in identifying relevant problem variables, converges with data from previous research which found that non-delinquents could be differentiated from delinquents by identifying more of these meta-cognitive variables (Note 1). Finding that another group of delinquents were deficient compared to non-delinquents in conjunction with finding that test-only delinquents in this study had such marked inability in identifying any social variables logically argues for concluding that delinquents have deficits in meta-awareness.

Adolescent Problem Inventory

Data indicated that delinquents have extreme difficulty in thinking up multiple solutions to solve social problems. Strategy or solution generation has been referred to as a meta-cognitive control skill (Flavell & Wellman, 1977). Test-only control subjects averaged only 2 solutions per problem. Moreover, most solutions generated were rated as socially incompetent. These data, corroborated by previous research which found delinquents to be deficient compared to non-delinquent peers in generating numerous quality solutions, (Freedman et al., 1978; Schumaker et al., 1982; Spivack et al., 1976) further support contentions that delinquents have deficiencies in meta-control skills.

Meta-Self-Assessment

Meta-self-assessment data indicated that there is little relationship between delinquents' self-perceptions of how sure they feel about successfully solving a social problem (i.e., self-efficacy) and their actual best solution generated to solve the problem. Correlations between self-assessment and actual performance, often demonstrated a negative relationship between self-efficacy and competence! Delinquents consistently overestimated their ability to solve a given problem.

It seems reasonable to assume that overestimation of abilities will affect social behavior. For example, it may: (1) preclude a lack of planning or preparation and thus increase chance of failure, (2) diminish attempts in actually adjusting behavior or learning how to cope better so as to increase competence, (3) increase feelings of frustration or demoralization when a problem is not easily resolved, and (4) increase feelings of external locus of control when expected success based on estimated ability is not forthcoming.

Evidence of poor self-assessment converges with meta-awareness data which found that delinquents had marked difficulty in identifying self-variables. Finding no evidence of accurate self-assessment once again indicates that delinquents have deficiencies in meta-cognition.

Additionally, these meta-self-assessment data call into question the applicability of self-efficacy theory (Bandura, 1977; Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977) for delinquent populations or individuals with poor meta-self-assessment skills. For example, self-efficacy theory hypothesizes that perceptions of self-efficacy predict future performance better than factors of past performance and treatment modality. However, no such relationship was found between delinquents' self-efficacy and their actual performance in solution generation. Thus, perceptions of self-efficacy appear to be "distorted" and bear no relationship to performance for individuals who possess deficiencies in meta-self-assessment skills.

Summary

The strikingly poor performance of delinquents on meta-cognitive tasks in which they are essentially unable to identify any relevant social problem variables, generate multiple competent solutions and assess their problem solving capability in conjunction with findings from previous research, which consistently documents delinquents' deficiencies compared to non-delinquents on a variety of other social cognitive tasks, strongly argues for predicting that delinquents manifest meta-cognitive deficiencies as compared to non-delinquent peers. This remains to be empirically tested.

Evidence of Treatment Effects

Cognitive Variables

Social meta–awareness skills. Quite clearly, treatment groups were able to identify more social meta-awareness variables. When meta-awareness was defined as identifying, labeling and remembering specific social problem variables then training was shown to produce marked meta-awareness improvement. Acquisition of new knowledge by delinquents as a function of training is not in itself a trivial finding when considering that subjects were individuals who have experienced life-long learning failures.

Adolescent Problem Inventory(API) . As previously explained (see Methods) training attempted to teach delinquents how to generate solutions of average or better quality. Trained delinquents showed some enhanced ability to produce better solutions to novel problems, however, there were no practical significant difference between trained and untrained delinquents for generating quality solutions.

Given that delinquents were trained on "institutional problems" and *API* problem situations were non-institutional (see Appendix D), limited improvement of *API* solution quality may have been due to insufficient generalization of trained skills for generating quality solutions in situations different from those practiced in training. An alternative explanation of these data might be that a failure in measurement prevented detection of improved skills. That is, there seems to be limited applicability of specifically *trained* skills to the *API* task or other hypothetical cognitive problem solving tasks.

Ford (1983), Keating (1978), and Glass and Arnkoff (1982) addressed this notion of a mismatch between social skills and measurement. These researchers emphasized that social cognitive assessment instruments may have nothing to do with actual social competence but instead may activate an academic orientation so that relevant social skills contribute little to the actual scores. For example, hypothetical problems, as in the *API*, lack rich stimulus cueing provided by real-life situations and to which trained skills in this study were directly related. *API* problems were simplified and verbally presented. Therefore, trained delinquents were not able to use such newly learned skills as paying attention to physiological cues caused by emotional arousal (i.e., hypothetical problems are less likely to generate emotional arousal); verbally self-instructing to control impulsive solutions; actively gathering (i.e., asking others, observing, etc.) meta-awareness information to produce effective solutions; and contrasting long and short term goals for choosing solutions.

Self–efficacy. Although training improved meta-awareness and overt behavior within the institution, it did not generalize to global perceptions of social self-efficacy as measured by self-ratings of ability to handle specific non-institutional problems (see Appendix C).

Bandura (1979) postulates three sources of information which enhance or attenuate perceptions of efficacy. These sources are experiences of personal mastery arising from activities of personal accomplishment with the task, vicarious experiences from observing a model similar to the self successfully coping with the task, and verbal persuasion from a credible expert.

In this study, delinquents were confined to the institution. Therefore, training was not able to provide delinquents with any experience of personal mastery for community-based problems assessed on the self-efficacy task. Moreover, contrary to requirements specified by Bandura, during training these delinquents were not able to vicariously experience a peer successfully coping with self-efficacy problem situations.

Thus, both trained and untrained subjects approached the self-efficacy task with "old" perceptions and evaluations formed over an extensive period of time (Goldfried & Robin, 1982, Taylor & Crocker, 1981) during previous experiences with community-based problem situations. In addition, any attributions from observing peers coping with these problems would have also been developed prior to institutionalization. Therefore, trained delinquents did not have access to two primary sources of information, mastery and vicarious experiences, postulated by Bandura as enhancing self-efficacy.

Moreover, training not only failed to enhance self-efficacy, but there is evidence to indicate that self-efficacy was actually lowered by training. Far fewer treatment subjects were at or above the 75%tile rank for self-efficacy (the mode over all subjects for this data) compared with attention subjects, thus indicating that social cognitive treatment lowered perceptions of efficacy while an alternative treatment maintained or increased efficacy.

Lowering self-efficacy may be a positive effect of training if it represents increased accuracy of self-appraisal. In view of *API* data which found that delinquents generally produce incompetent solutions, low ratings of self-efficacy reflect a more self-aware response. Thus, training either increased delinquents' awareness of their lack of skills or increased awareness of how difficult or complicated social problems are to solve, resulting in lowered perceptions of social efficacy.

Meta-self-assessment of problem solving competence. There were no statistically significant differences between treatment and control groups on accurately predicting social capability. The simplest explanation for this finding is that treatment delinquents were not specifically trained to accurately appraise their problem solving abilities and therefore there was no change in their ability to do so. Given that delinquents seem to be considerably inaccurate with self-appraisal it is probable that this skill needs to be specifically trained if accuracy is to be increased.

Behavior Measures

Self-ratings of behavior. Findings from self-ratings of behavior indicated that meta-cognitive training enhanced treatment delinquents' perceptions of being able to get along socially and solve social problems. Moreover, from a clinical perspective it is noteworthy to find that delinquents rated the treatment curriculum extremely favorably.

Devereaux behavior ratings. When interpreting behavior rating data a significant concern for the investigator is discovering whether a behavior rating score is more reflective of the rater than of the subject (McFall, 1981). It may be that ratings measure something other than what is reflected in overt behavior measures. Comparing proportions of delinquents for each group who were rated as improved or worsened on the Devereaux to proportions of delinquents who had improved on actual behavior, as measured by behavior reports and phase level advances, indicates that Devereaux ratings did not correspond strongly with these actual behavior measures.

Given that improvement on the Devereaux was not actually reflective of concrete, discrete behavior, it is difficult to know what the Devereaux ratings actually mean. The ratings seem to be more a reflection of staff than delinquents. Therefore, it is untenable to use this behavior rating data for drawing conclusions about subjects' actual overt behavior.

Overt behavior measures (behavior reports, phase level advances, good days credit and treatment goal progress). On every measure of overt behavior, LD and NLD treatment groups had considerably greater proportions of improved subjects. Trained skills not only generalized to enhance behavior in a variety of situations outside of training sessions but skills were also used without cueing or specific reinforcement from the environment. Moreover, cognitive skills enhanced behavior in novel social problem situations within the institution. Additionally, trained skills positively influenced behavior during a 15 day period after training had terminated.

Consequently, it is concluded that meta-cognitive training, as defined in this study, was able to mediate overt social behavior. Influences on overt social behavior of meta-cognition hold for youth, both LD and NLD, differing in basic attributes of sex, race and language age. Additionally, meta-cognitive skills accounted for overt behavior change over and above variables such as prior convictions, gang affiliation and severity of committing offense, all of which can be reasonably expected to influence behavior. Therefore, generalizability of the theoretical model to a heterogeneous group of low-achieving delinquents is supported.

The case of practical significant differences and socially valid differences is made by noting the consistent trend of treatment groups to have marked improvement on all four measures of social adjustment. This trend even holds when improvement is defined conditionally as better achievement in both behavior reports and phase level.

Gresham (1981) asserted that social validation of treatment effects is provided by the quality and significance of outcomes. Accordingly, it is argued that reduction of negative behavior behaviors, promotions in phase level and increase in good days credit imply increased freedom and shorter incarceration of a delinquent. Thus, of paramount importance in this analysis of natural measures is that social validity of treatment effects is clearly demonstrated.

Moreover, finding improvement in meta-awareness as well as overt behaviors was critical for "confirming treatment mechanisms" (Kendall, 1981; Kendall & Korgeski, 1979; Kendall, Pellegrine, & Urbain, 1981). When a cognitive intervention is said to have produced behavior change, it is necessary to demonstrate that changes in the targeted cognition are associated with changes in behavior.

Treatment mechanisms in this study were confirmed in two ways: (1) finding that treatment subjects were superior to control subjects on both meta-awareness and behavior variables; (2) finding that both meta-self and meta-other scores were significantly and positively correlated with changes in overt behavior variables, such as maintaining highest phase ($p < .03$, $p < .05$), maintaining no reports at two weeks posttesting ($p < .001$, $p < .04$), and achieving treatment goals according to institutional staff ($p < .08$, $p < .05$). Treatment groups increased on both meta-cognitive and overt social behaviors as a consequence of intervention, therefore it can be inferred that social meta-cognition mediated social adjustment.

Summary

It was hypothesized that treatment subjects would out perform control subjects on all cognitive as well as all overt behavior dependent variables. Data indicate that training enhanced all overt dependent variables but only some cognitive variables. It was additionally hypothesized that meta-cognitive training would significantly enhance overt social behavior. This hypothesis was supported.

Because dependent variables were selectively affected, they were apparently differentially sensitive to cognitive intervention in terms of generalization. Moreover, it appears that trained cognitive skills in this study were more easily generalized to overt behavioral tasks than to cognitive tasks. It was apparently incorrect to have assumed that generalizing cognitive skills to tasks within the behavioral domain is a "far" generalization while generalizing cognitive skills to tasks within the cognitive domain is a "near" generalization. The critical factor for generalization is more likely the goodness-of-fit between task and skills as well as between task and training practice.

Demonstrating that meta-cognition can mediate overt social behavior is essential initial evidence for supporting the causal hypothesis that cognitive deficiencies increase risk for delinquency. These findings, however, cannot be interpreted to confirm a cognitive deficiency etiology of delinquent behavior. Nevertheless, these data, in conjunction with baseline assessment data derived from test-only control subjects who demonstrated profound difficulties in social meta-cognitive tasks, substantially endorse the merits of a hypothesis which specifies meta-cognition as a causal factor for delinquency in learning disabled adolescents.

Evidence of Differential Effects of Treatment for LD and NLD

Thus far the discussion has been concerned with interpreting data relevant to all delinquents in the study, regardless of their LD or NLD category. However, there were some differences in how LD and NLD delinquents responded to various dependent measures.

Before comparing LD and NLD categories, it is important to emphasize once again that LD was uniquely defined for this study. Both LD and NLD subjects were selected from a pool of low-achieving delinquents. Outside of the institutional setting, it is unlikely that these adolescents would be reliably differentiated (Ysseldyke et al., 1982). The strength of this research design was defining, identifying and differentiating low-achievers in a reliable and replicable way. This stringent identification procedure allowed a rigorous test of the unique effects of learning disability. That is, LD and NLD delinquents were similar except on the specifically defined LD variable which was essentially *responsiveness to instruction* (i.e., extremely low achievement or marked discrepancy between achievement and potential or teacher rating as difficult to teach).

Accordingly, at baseline there was a guarantee of non-equivalence between LD and NLD categories regarding LD (i.e., responsiveness to instruction and concomitant attributes). Consequently, it makes no interpretive sense to directly compare LD and NLD categories on dependent variables. Therefore, examination of differential effects between LD and NLD categories is accomplished by comparing each category to its own baseline control groups and then contrasting LD and NLD categories on their degree of movement above baseline.

Comparisons to Control Groups

When comparing LD and NLD categories to their respective control groups, data indicate that both categories benefited from training. However, when examining cognitive and overt behavior variables where there was a significant difference between treatment and control groups, overall assessment seems to indicate that LD treatment delinquents benefited on more variables than NLD treatment delinquents.

Moreover, an argument can be made that treatment more powerfully impacted overt behavior of LD delinquents than NLD delinquents. That is, LD delinquents were perceived by institutional staff and research trainers as more difficult to work with because of acting out problems and poor impulse control. The LD delinquents had significantly more behavior reports and fewer good days credit than NLD subjects (see Table 28). Additionally, the LD delinquents were rated as more deviant on all 12 Devereaux behavior factors than NLD delinquents. Thus, LD delinquents were more maladjusted in their behavior at baseline; however, LD and NLD were equivalent on improvement of overt behavior measures at post treatment. This indicates that treatment may have more strongly affected LD subjects. One explanation of this finding is that the more severely behavior disordered subjects (i.e., LD) had a lower threshold for improving their overt behavior given training in self-control, while those subjects with some degree of self-control (i.e., NLD) would be less dramatically impacted by training in self-control.

It appears that training affected LD subjects on a greater number of cognitive variables; however, because of non-equivalent baselines and high variability within each group, this interpretation does not reflect size of treatment effect experienced by LD and NLD groups.

Meta-Analysis

A meta-analysis (see Appendix J) was performed on cognitive variables so that a more direct comparison of LD and NLD categories could be made with respect to magnitude of treatment effect. Both LD and and NLD treatment groups demonstrated a positive effect from training on all cognitive variables (except quantity of solutions for LD). Essentially this means that given treatment, the average of LD and NLD control groups, on a given cognitive variable, can be expected to increase. This analysis found that, on a number of cognitive variables, NLD subjects had a larger treatment effect size than LD subjects (see Table 29). One explanation of this data is that because NLD subjects were more skilled academically and cognitively, they were also more able to apply and generalise cognitive skills within the cognitive domain. This explanation that NLD subjects were more competent in the cognitive domain, seems plausible considering that NLD groups had higher means than LD groups on cognitive tasks.

Summary

Because there was no hypothesis regarding differential effects for LD and NLD delinquents, these data represent initial information regarding social meta-cognitive treatment impacts on two sub-groups of low-achieving delinquents. It appears that NLD subjects may have been more powerfully impacted on cognitive variables and LD subjects more powerfully impacted on overt behavior variables. This conclusion should be interpreted cautiously, however, given the small sample size of groups.

A more parsimonious interpretation of LD and NLD responses to treatment is that social meta-cognitive treatment was effective for a heterogeneous group of low-achieving delinquents, although some delinquents were affected qualitatively differently than others. That both groups benefited from training corresponds with Schumaker et al. (1982) and Hasel et al.'s (1982) conclusions that acting out LD adolescents and delinquent adolescents are similar on social skill deficits.

However, because these NLD and LD subjects were similar, except on the LD variable of responsiveness to instruction, positive treatment effects for both groups indicates that *responsiveness to instruction*, as an LD defining variable, does not differentiate low-achieving individuals with regard to benefits of social cognitive treatment intervention. This finding is significant for LD instructional research and provides empirical support for special education programs which focus on developing social competence. Using a cognitive instructional approach it is reasonable to predict that special education programs can be constructed with the expectation of fostering general social competence in LD youth.

Data imply that LD and NLD low-achieving delinquents share common characteristics which make them susceptible to treatment. It appears that some sub-set of low-achieving youth (some of whom are LD) are similar with regard to social meta-cognitive characteristics and are equally at risk for delinquency. The greater proportion of adjudication within the LD population implies that youth identified as LD are more likely to manifest social meta-cognitive deficiencies than low-achieving youth not identified as LD. This speculation makes sense given that identified LD youth are described, by definition, as cognitively ineffective (e.g., Torgesen, 1977). The increased risk for delinquency in LD youth may indicate that non-social cognitive problem solving deficits are predictive of social cognitive problem deficits, but not vice versa.

Previous speculations concerning the link between LD and delinquency have postulated psychological traits (susceptibility hypothesis) or environmental factors (school failure and differential treatment hypothesis). This research provides empirical evidence for an alternative view of the link between LD and delinquency. Social difficulties and delinquency in LD youth are hypothesized as resulting from LD youths' ineffective meta-cognitive approaches to social problem solving.

Although deficits in meta-awareness or meta-control skills are specifically postulated, it is not clear which specific skills of these functions are deficient in LD youth. Moreover, it is reasonable to predict that individual LD youth are deficient in different meta-cognitive skills. However, assuming that meta-awareness and meta-control skills function reciprocally, a deficiency in one skill would negatively impact or incapacitate those skill functions where competence potentially exists. For example, learning disabled youth could have difficulty with only one or two skills within the social meta-cognitive problem solving process: application of past experience and knowledge, delineation of task goals, selection of effective solutions or tactics, means-end thinking, action execution or self-monitoring, or use of feedback. However, all functions might become ineffective because of the interactive nature of skills in the problem solving process. Thus, it will be a difficult research task to identify specific areas of deficiency. Future research needs to systematically and empirically assess the amount of variance in social competence explained by each of these skill.

General Conclusions

Implications for Cognitive Training

One dilemma which has faced cognitive trainers in the past is the issue of power versus generality. That is, it has been assumed that training of *specific* cognitive skills is very *powerful* for changing specific behavior but limited in generalizability; conversely, training of *global* cognitive skills was assumed to have great general application but *limited power* in terms of actually changing overt behavior (Loper & Hallahan, 1982).

However, this investigation presents striking evidence that a cognitive intervention can be both general and powerful. This dual capacity of generality and power attests to the significance of meta-cognitive training for increasing social competence. Furthermore, the global mediational power of meta-cognition suggests that social competence is a general social aptitude as opposed to a situation specific or *episodic* aptitude. Thus increased social competence appears to require general as well as specific skills training. Additionally, it should be emphasized that unlike most other social cognitive training programs, training in this study was both complex and intense with specifically planned techniques to boost generalization of learned skills to overt behavior. Success of the program signifies that it is probably unrealistic to expect meaningful social change when applying simple short term cognitive intervention.

Implications for Delinquency Rehabilitation

Traditional rehabilitation efforts have assumed a *performance deficit* explanation of delinquent behavior. That is, delinquents are presumed to possess appropriate social skills but do not perform these skills either because of anxiety or low motivation. Accordingly these performance deficits are primarily remediated through manipulation of consequences. Unfortunately, traditional rehabilitation methods using consequent management have met with limited success in terms of generalization of skills to novel contexts (Emery & Marholin, 1977).

This investigation supports evidence that delinquents manifest *self—regulation deficits* of social meta-cognition as opposed to performance deficits. Training self-regulation through meta-cognitive problem solving was effective for increasing generalization of appropriate behavior to novel contexts within the institution. A heterogeneous group of delinquents, some severely behavior disordered, were able to improve their social behavior more than control subjects who essentially received consequent management intervention. Moreover, trained delinquents received no specific cueing outside of the training context for using the newly learned cognitive skills and indeed may have been negatively reinforced for doing so.

Therefore, it is reasonable to venture that meta-cognitive skills as defined in this study, can generalize and mediate behavior in contexts outside of institutions. This is a hopeful implication and one that needs empirical testing. Thus, this study offers evidence that rehabilitation efforts need to include social cognitive problem solving training as well as the traditional interventions of vocational training and academic remediation.

Another noteworthy finding, with implications for delinquency rehabilitation, is the possibility of a potential mismatch between institutional staff perceptions of delinquents' improved behavior and actual improved behavior. Because feelings of learned helplessness (Rotter, 1966) and external attributions of control are likely to increase under such conditions, this phenomenon is important in its undesirable potential for decreasing delinquents' abilities in maintaining self-control over their own behavior. In turn, learned helplessness and external locus of control increase vulnerability to peer pressure and impulsive responding, two characteristics common to delinquent youth (Schumaker et al., 1982; Stein, 1968; White, 1965). Additionally increasing external locus of control will diminish meta-self-awareness, thus increasing risk for failures in self-regulation (Kirschenbaum & Tomarken, 1982).

Findings from this study also imply that any rehabilitation efforts which specifically attempt to increase social self-efficacy may serve to magnify deficiencies in delinquents' meta-self-assessment skills if positive changes in overt social competence are not commensurate with increased perceptions of efficacy and training in self-appraisal is not specifically programmed. Thus it appears to be inappropriate for delinquency rehabilitation to have a goal, in and of itself, for increasing self-efficacy.

Theoretical Implications

The first critical test of a hypothesis specifying meta-cognitive deficiencies as increasing risk for delinquency was accomplished by demonstrating mediational capacities of social meta-cognition for overt social behavior. This is a remarkable and significant finding from both a clinical and theoretical perspective. However, the hypothesis that meta-cognitive deficiencies increase risk for delinquency is not confirmed when demonstrating mediational capacities of cognition. An alternative explanation of data is that some process other than meta-cognitive deficiencies, increases risk for delinquency and meta-cognitive skills work in a compensatory capacity to mitigate this risk. Thus, meta-cognition may be a sufficient but not a necessary condition for preventing delinquent behavior. However, data from this study, documenting profound difficulties in specifically defined meta-cognitive skills of untreated LD and NLD delinquents clearly suggest that it is reasonable to postulate that social meta-cognitive deficiencies cause LD youth to be susceptible to delinquency.

Nevertheless, it is imperative to remember that, despite cumulative data from this and previous research pointing out the efficacy of training specific skills labeled as *meta–cognitive* (awareness and control), meta-cognition may actually describe different skills and/or unique applications of thinking for every individual said to "possess" meta-cognition. Thus, the meta-cognitive skills defined and trained in this study may only "function like" (in terms of increasing competence) cognitive skills utilized by competent problem solvers. If this is the case, it becomes extremely problematic to "assess" non-delinquents on specifically postulated meta-cognitive skills.

Future Recommendations

Speculations that social incompetency may be a function of ineffective social meta-cognition has implications for both clinical and research practice. Both limitations and implications of this research point to potentially fruitful areas of future investigation.

With regard to applied research, two recommendations emerge from this study. First, this research design clearly demonstrated the critical need of having an attention control group when examining training effects in a group of incarcerated (or similarly situated) individuals. That special attention alone enhances cognitive and overt behavior responses was consistently evident for every dependent variable. Thus, empirical examination of rehabilitation efforts requires contrasting treated subjects to subjects receiving an alternative program. Secondly, *API* data imply that it may be inconsistent to expect subjects, specifically trained in applying cognitive skills to real life stimuli (as needed to boost generalization), to apply those skills in interview or lab settings. Problem solving using real life cues and problem solving using hypothetical cues (i.e., interview tasks) may require different and possibly contradictory skills; therefore, the common practice of measuring cognitive training effects with cognitive problem solving interview data may be inappropriate.

Several studies are suggested by this research study:

1. An immediate follow-up study comparing social meta-cognitive skills of delinquent and normal youths, both LD and NLD, is critically needed. Demonstrating deficiencies in meta-cognition for delinquent youth compared to non-delinquents would test the alternative hypothesis that mediational capacities of meta-cognitive skills are compensatory factors. However, as previously noted, social meta-cognitive skills as specifically defined in this study, may appear not to be present in non-delinquents. One way to test if non-delinquents possess meta-cognitive skills which function like those postulated in this study would be to train non-delinquents with the postulated skills. If non-delinquents utilize other

skills for "meta purposes" than their behavior should not be enhanced.

2. There is a need to replicate findings from this study and examine efficacy of meta-cognitive training in terms of long term follow-up for crime reduction. There is sufficient support for developing and evaluating the efficacy of a community based cognitive training intervention program.

3. Another important study would examine the relationship of specific cognitive skills to behavior change. In this regard, assessing and comparing potential effectiveness of this investigations' three meta-cognitive components (*VSI, META, PSP*) would help elucidate more specific relationships between cognition and social skill.

4. Research is also needed to evaluate the efficacy of meta-cognitive training as a prevention measure for other groups of socially incompetent youth. For example, delinquents on probation, behavior disordered or "troublesome" adolescents who are attending alternative schools or special education programs and LD youth who manifest social skill difficulties are all plausible candidates for benefiting from social meta-cognitive training. It would also be appropriate and valuable to test the efficacy of social meta-cognitive training with younger youth.

NOTES

Note 1. Herron, (January, 1983). Personal communication, Langley Porter School, CA.

Note 2. Larson, K.A. (October, 1983). *Social meta–cognition in learning disabled delinquents: Theoretical speculations for a causal model.* Paper presented at the Council of Learning Disabilities International Conference.

Note 3. Ysseldyke, J.E. (August, 1983). *Generalizations from research on assessment and decision making.* Paper presented at Special Education Leadership Conference, Sacramento, CA.

Note 4. *Identifying educationally handicapped students in the Youth Authority.* (1982). California Department of the Youth Authority. Unpublished technical report.

Note 5. *California Almanac.* (1984). Cited source: California Department of Justice, Bureau of Criminal Statistics, 1982.

Note 6. Cornelius, P.L. (1983). *Meta–analysis in special education: A critique.* Technical report 101. Graduate School of Education, University of California, Santa Barbara, Special Education Research Institute.

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APPENDIX A

LD Identification Decision Rule

Decision rules for discriminating LD from NLD delinquents used academic, ability, and teachability data. Reading grade levels, Peabody Picture Vocabulary Test standard scores and a teacher rating of teachability were used as data for modeling institutional decision making. Reading grade was determined by the Test of Adult Basic Education (TABE). The TABE reading vocabulary and comprehension items were adapted from the California Achievement Test, 1970 edition. The manual reports a total reading test-retest reliability of .85. The Peabody Picture Vocabulary Test (PPVT) uses pictures in a multiple choice format to assess receptive vocabulary. For standard score comparisons, the manual reports a median test-retest reliability of .79. The PPVT has been reported to have a median correlation of .71 to the Binet IQ test and a median correlation of .77 to the full scale WAIS IQ test; therefore, the PPVT was used as an estimate of ability. The teachability scale was derived from research of Borco & Cadwell (1982) who used a similar sale for modeling teacher decision making. The teachability rating was achieved by having two teachers rate each student on a 7 point Likert-type scale. Using both teacher ratings an average score of teachability was calculated. The teachers were asked to rate the students on the following questions (a low score = difficult student):

1. Does the student usually need considerable teacher supervision during class activity?
2. Please estimate how motivated this student is during class activities.
3. Please estimate the student's social interaction skills.
4. How easy is this student to teach?
5. Please estimate the student's academic potential.
6. How much does this student need special education services?

A three part composite and conditional decision rule for classifying a student as

LD accounted for 92% of institutionally identified LD students. The decision rules for LD classification were:

1. Total reading grade level on the the TABE equal to or less than 4.7 and a PPVT standard score at 62 or less. or
2. Total reading grade level on the TABE more than two years *below* the PPVT grade level score. or
3. Average teacher rating of 3.0 or less on both questions.

Table 1 shows the results of applying these decision rules to the total sample of low-achieving students. After the study was in progress, 13 of the 14 subsequent institutional referrals for special education evaluation fit this LD classification rule criteria, further validating the decision model. It is not known if the students were subsequently assessed and identified as LD. Nonetheless, it appeared that the decision rule modeled quite accurately the institution's decision making process with respect to LD referral and identification. Indeed, the decision rule was able to predict very well which students would be referred before they were referred.

APPENDIX B

Consent Form for Volunteer Subjects

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DEPARTMENT OF EDUCATION   SANTA BARBARA, CALIFORNIA 93106

To: Students

You are invited to participate in a training program which will teach logical thinking and problem solving skills. The training will teach how to apply thinking skills to social problems. This training will be conducted by a University in Santa Barbara. You will receive a Certificate of Completion from Ventura School and also one from the University.

About the group: The group will meet every day for periods 1 and 2. You will miss your regular school periods 1 and 2 for about a month and instead you would come to the training class. You will get high school credit while attending the training class. Groups will be conducted by an experienced teacher from the University. Group sessions will include a lot of group discussion about the thinking skills but the class will also include demonstration of how to apply the skills and practice of the skills on typical social problems. We think the sessions will be interesting.

Thanks,

Hope you join us

I understand that this training is trying to increase problem solving and thinking skills. I realize that my participation is entirely voluntary and that I may decide not to participate. If I wish to withdraw from the training, I will not be penalized. I also understand that my statements and answers during the training will not be revealed and that my responses are confidential.

print name   signature   date

If you have any questions please leave
a message for KATHY LARSON and I will
contact you. You may also write to
U.C.S.B. Office of Research and
Development.

APPENDIX C

Self—Efficacy Problem Situations: Posttest

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SELF EFFICACY

question: HOW SURE DO YOU FEEL THAT YOU COULD SOLVE THIS PROBLEM WITHOUT MAKING THE SITUATION WORSE?...WITHOUT MAKING MORE TROUBLE FOR YOURSELF.

1. You're visiting your Aunt in another part of town, and you don't know any of the people your age. You're walking along her street, and some person your age, sex, race and size is walking toward you. As this person is about to pass you, they deliberately bump into you and you nearly lose your balance.

2. Your gym teacher is a nasty guy, and you think he must have it in for you, because he's always picking on you. Today he's been on your back all priod, and you've already had to do extra exercises. You're so tired you don't think you can do another one, but all the other students are standing around watching what will happen. Now he says to you, "OK, let's see 30 more, and get some energy into them!"

3. You're driving around with a good friend on a hot, muggy summer night, and your friend says, "Whew, am I thirsty! I could really use a cold beer. Listen, I know a guy who sells it, to anyone who comes, right off his front porch, and he doesn't even check ID. How about our going over that way and getting some booze?"

4. You've been going steady for about three months. It used to be a lot of fun to be with your boyfriend/girlfreind, but lately it's been sort of a drag. There are some others you'd like to go out with now. You decide to break up but you know your boyfriend/girlfriend will be very upset and angry with you. They may even tell lies about you to the other people and hurt your chances with them.

5. One of your friends does some dealing on the street. Once in a while, he even gives you some pills or something for free. Now he says to you, "Listen man, I've got to deliver some stuff on the south side, but I can't do it myself. How about it - will you take this stuff down there for me in your car? I'll give you some new stuff to try plus $25 besides, for half an hour's driving. Will you help me out?"

6. You and your friend want to go driving around one evening, but when you tell your father or mother where you are planning to go, they get very angry. They say, "I don't want you hanging around with that kid. They're no good for you. You're not going out of this room if you plan to meet them!"

7. You're walking through the school yard one day, and another student you don't know very well calls you over. The other student smiles and says, "Hey, I've got a friend who would like to spend the night with your mother--does she need some extra money?"

8. You're brousing in a discount department store with a friend. You're in the sporting goods section. You look around and notice that the glass case where they keep hand guns is open, and the guns are just lying there, where you can reach in and grab them out. There's nobody in sight, no customers and no employees. Your friend says, "Quick man, let's get some."

9. Someone in school has recently been defacing the walls of the restroom by writing obscene words all over them in black paint. Mr. Redford, a teacher in school, has always had it in for you. Today he calls you out of your class, and says to you in the hall, "OK, we know you're the one who wrote all over the walls in the john. I recognize your writing. Didn't you even have the brains to disguise your writing?" You know you didn't do it and you're furious because he's accusing you.

10. You're walking along a side street with a friend, and he stops in front of a '72 Malibu. He looks inside and then he says excitedly, "Look man, the keys are still in this machine! Let's see what she can do. Come on, let's go!"

11. You have a friend who's a few years older than yourself. Your friend has been in trouble with the law a lot and also spent some time in prison, but is out now. You really like this person and respect them and you wish they would like and respect you too, because this person is popular in the neighborhood. Your friend comes around to your house one night and tells you that two of them are going to hold up a gas station out in the country. Your friend says, "You want to come along? We think you could be a big help to us."

12. You're on parole after 15 months in an institution. You're back in your old school, and it's been hard, getting back in with the other students, and especially with the teachers. A couple of teachers are on your back all the time, always hassling you because of your record. Just now, one of them has surprised you in an empty classroom, where you're catching a smoke, which is against the school rules. The teacher says, "OK, just what do you think you're doing in here? Didn't you learn anything in that reform school?"

13. The girlfriend/boyfriend you've been going out with just broke up with you. She/he said that you're OK, but they'd like to go out with others. You still did her/him, and you're hurt that they don't want to go out with you and continue to be your girl/guy. You're in a terrible miserable mood. You feel really down.

14. You've been having trouble in a class because the work seems to hard for you. But you've felt embarrassed to tell the teacher it's too difficult for you. So what you've been doing is cutting classes. Now it's a week before a big exam, and you're completely lost. You don't know what's going on.

15. It's Friday night and you have the car but you don't have anywhere to go. The evening stretches ahead of you, empty. You're bored, and you feel restless and you wish there were some excitement.

APPENDIX D

Adolescent Problem Inventory Problem Situations: Posttest

API INTERVIEW

note: be sure the person says exactly what and how they say something to the other....have them pretend you are the other.

1. It's early afternoon and ever since you wake up this morning, you've been in a bad mood. You feel empty, tired, a little sad. and a little angry, all at the same time. What would you do or say now to solve this problem? What's something else your could do or say?

2. You're about an hour late getting to your part-time job in a supermarket because your car ran out of gas? You feel pretty dumb about that and you know your boss will be mad, because this is the busiest time of the day in the store. You punch in at the time clock and he comes storming over to you and says, "You're fired! I've put up with you kids being late and not coming in, one time too many. Starting with you, anyone who comes in late gets canned!" What would you do or say now to solve this problem? What's something else you could do or say?

3. You're at a party and all the people there are smoking grass. You used to do a lot of smoking yourself, but now you're on parole because you got busted. Drugs are against the conditions of your parole. Everyone knows you used to smoke. Your girlfriend/ boyfriend offers you a joint. What is the best thing you could do or say to solve this problem? What else could you do or say?

4. You're on parole after 13 months in an institution. You're back in your old school, and it's been hard, gett[illegible] back in with the other students, and especially with the teachers. [illegible] couple of teachers are on your back all the time, always hassling [illegible] because of your record. Just now, one of them has surprised you in an empty classroom, where you're catching a smoke, which is against the school rules. The teacher says, "OK, just what do you think you're doing in here? Didn't you learn anything in that reform school?" What is the best thing you could do or say to solve the problem? What else could you do or say?

5. You're browsing in a discount department store with a friend. You're in the sporting goods section. You look around and notice that the glass case where they keep hand guns is open. and the guns are just lying there, where you can reach in and grab them out. There's nobody in sight, no customers and no employees. Your friend says, "Quick man, let's get some." What is the best thing you could do or say to solve the problem? What else could you do or say?

6. You're visiting your Aunt in another part of town, and you don't know any of the people your age. You're walking along her street, and some person your age, sex, race and size is walking toward you. As this person is about to pass you, they deliberately bump into you and you nearly loose your balance. What would you do or say to solve this problem? What is something else you could do or say?

7. You're driving around with a good friend on a hot, muggy summer night, and your friend says, "Whew, am I thirsty! I could really use a cold beer. Listen, I know a guy who sells it, to anyone who comes, right off his front porch, and he doesn't even check ID. How about our going over that way and getting some booze?" What is the best thing you could do or say to solve this problem? What is something else you could do or say?

8. Someone in school has recently been defacing the walls of the restroom by writing obscene words all over them in black paint. Mr. Redford, a teacher in school, has always had it in for you. Today he calls you out of your class, and says to you in the hall, "OK, we know you're the one who wrote all over the walls in the john. I recognize your writing. Didn't you even have the brains to disguise your writing?" You know you didn't do it and you're furious because he's accusing you. What is the best thing you could do or say now to solve the problem? What is something else you could do or say?

9. One of your friends does some dealing on the street. Once in a while, he even gives you some pills or something for free. Now he says to you, "Listen man, I've got to deliver some stuff on the south side, but I can't do it myself. How about it - will you take this stuff down there for me in your car? I'll give you some new stuff to try plus $25 besides, for half an hour's driving. Will you help me out?" What is the best thing you could do or say now to solve this problem? What is something else you could do or say?

APPENDIX E

Overview of Training Curriculum

Introduction

Training classes met for 1 3/4 hours three times each week for seven weeks. In general, training consisted of trainer and students reading aloud and following lesson plans distributed to each student. Each lesson was organized around large cartoon-like posters, which served to focus discussion and attention (see Appendix F). Lesson plans presented an orderly sequence of cognitive training skills. Social problem scenarios or episodes were presented daily and subjects practiced applying newly learned cognitive skills to simulated problems. Thus, daily activities consisted of: (a) reading lesson plans aloud, (b) discussing concept questions, (c) drill of steps and procedures, (d) participant modeling, (e) self-evaluation and group discussion of how well one was applying the skills learned, and (f) review of previous lessons.

The training lessons were very structured, complex and detailed. The following is a brief synopsis of main activities and ideas for each lesson. See Appendix F for a sample lesson.

LESSON 1

- Introduction to the class and trainer.
- Main ideas:
  - Scientists have studied how experts solve problems and these expert techniques can be learned.
  - Social problems are a common part of everyday life, problems are solvable and students are capable of learning and using expert techniques.
  - Self-control increases personal power and external control decreases personal power.
  - By becoming incarcerated one has given to society their personal power or self-control.
  - Thinking skills will help students influence the world without eliciting negative consequences.
- Introduce problem solving steps.

LESSON 2

- Teach problem solving step 1: **RECOGNIZE THAT A PROBLEM EXISTS**
- There are two ways to recognize a problem exists:
  1) If one is emotionally upset.
  2) If one is about to break a rule or law.
- Main ideas:

  - The problem exists before one starts to break a law. The problem does not begin when one gets caught.
  - The problem is a situation which can have a desirable or undesirable outcome.
  - The action of breaking the law is a solution to the problem. When punishment or negative consequences occur it is a signal that one's solution did not work well. Solutions, not problems, get us into trouble. Therefore, before one breaks a rule or law, one needs to begin to think about how to solve the problem without making the situation worse.
  - Use upset emotions and/or thoughts about breaking the law as signals to stop and think.

- Introduce problem solving step 2: **STOP AND THINK**

LESSON 3

- Teach problem solving step 2: **STOP AND THINK**
- Main ideas:
  - Thinking requires controlling impulsive responding
  - Expert problem solvers talk to themselves silently or tell themselves what to do. This is called self-talk.
  - Talking is a way of giving ourself power because we are using self-control and not letting the situation or others control us.
  - Controlling first impulses and ignoring the irritation may actually be the solution to the problem.
  - If a problem keeps happening, then controlling first impulses and ignoring is not a sufficient solution. It is then necessary to use steps 3-9 to solve the problem.
  - Solving problems in a smart way requires either controlling first impulses and ignoring the problem OR controlling first impulses and using thinking skills to arrive at a solution.
  - If you don't want to think things out then the only smart choice is to ignore it.
- Teach self-talk technique for controlling first impulses.
- Students create and write down a personal self-talk phrase.
- Model and covertly practice self-talk when presented with four problem scenarios.

LESSON 4

- Introduce step 3: **GET THE FACTS**
- Play Twenty Questions attribute game to demonstrate that not all information is valuable in terms of problem solutions.
- Present problem scenarios and students brainstorm what facts or information would be important to find out in order to solve the problem well.
- Main ideas:
  - Using step 3 means that controlling first impulses and ignoring the situation did not solve the problem.
  - How to get facts and where to get facts is just as important as knowing what facts to get.

LESSON 5

- Teach step 3: **GET THE FACTS**
- Main ideas:
  - People interpret you and you interpret them based upon facts each of you have gotten.
  - It is important to get the facts because facts tell you what you think of a situation and what you think determines what action you take.
  - Facts tell how hard or easy the problem will be to solve.
- Students brainstorm where and how to get the facts identified as important in the problem scenario presented in the last lesson.
- Students role play asking direct and indirect questions of others to get the facts in a given problem situation.

LESSON 6

- Teach step 3: **GET THE FACTS**
- Introduce idea that this program will teach students how to find 21 important facts in social problems.
- Introduce idea of facts about others and facts about self for solving social problems.
- Present poster of facts about others.

- Students compare facts about others with facts they had previously brainstormed as important. Identify what facts were omitted and included, etc.

LESSON 7

- Teach step 3: **GET THE FACTS**
- Main ideas:
  - Facts tell us our limitations and strengths in a given situation and therefore we can figure out how to compensate and thus increase our chances of a successful solution.
  - Facts tell us how hard a problem will be to solve and facts give us hints as to how to solve the problem.
- Students discuss, for every other fact, how specific information can influence the difficulty of the problem and give hints as to the solution. Example: Finding out if the other is highly emotional is an important fact. If the other person is calm the problem will be easier to solve. If the other person is very angry and hostile it tells us that we may need to walk away for a while and not try to reason with them.

LESSON 8

- Same as lesson 6 except with self facts.

LESSON 9

- Same as lesson 7 except with self facts.

LESSON 10

- Written quiz on major concepts previously presented.
- Present students with a problem scenario and practice, as a group, applying problem solving steps 1, 2 and 3. Repeat on different problems.

LESSON 11

- Introduce step 4: **STATE THE PROBLEM AND GOALS**
- Main ideas:
  - Stating the problem clearly helps one decide what they want.

- There are two ways to figure out what the problem is:
  1) State exactly what happened or is happening.
  2) Be aware when you are going to break a rule or law and then think about what it is you are trying to accomplish or solve by your action. What it is you are trying to solve or achieve is your problem. Often the problem is psychological in nature; e.g., fear, greed, need for self-esteem, need to have fun, revenge, etc.

- Students practice identifying the problem when presented with hypothetical solutions; e.g., wanting to get drunk, cheating, insulting someone are all solutions to underlying problems.

LESSON 12

- Teach step 4: **STATE THE PROBLEM AND GOALS**
- Main ideas:
  - Short term goals are immediate desires of the moment or goals for the present problem. These change constantly.
  - Long term goals are things we would like to accomplish over a period of time...days, weeks, months or years. These goals do not change often.
  - When solving social problems it is necessary to think of both short term and long term goals.
- Students identify given goals as short or long term.

LESSON 13

- Students identify, record in notebook and share personal long term goals in the area of work, education, family, recreation, interpersonal relationships and economic status.

LESSON 14

- Teach step 4: **STATE THE PROBLEM AND GOALS**
- Main ideas:
  - Solutions which attempt to achieve short term goals without considering the impact on long term goals will often hurt our future. We pave our road for the future--it can be rocky or smooth.
  - It is essential to find out the other person(s)' goals or desires for the immediate problem.

  - Solutions must achieve both our own and the others' goals.

LESSON 15

- Students are presented with social problem situations and short and long term goals. Students practice brainstorming potential solutions.

LESSON 16

- Teach step 5: **MAKE PLANS.**
- Main ideas:
  - It is probably necessary to compromise twice during the problem solving process. First it is often necessary to compromise with oneself in terms of changing one's short term goal so that it is compatible with one's long term goal. Second it will often be necessary to compromise with the other(s) involved so that both our own and their desires can be satisfied.
  - It is not a solution if it makes the problem worse. Don't consider solutions which obviously make the problem worse or obviously make other problems; i.e., murdering the other.
  - Sometimes it is not possible to compromise between your short term and long term goals. Sometimes it is necessary to give up short term goals so that the long term goal is not hurt.
- Students are presented with social problem scenarios. Students identify short and long term goals (hypothetical) and brainstorm solutions which do not hurt the long term goal and which potentially satisfy all people involved.

LESSON 17

- Students practice steps 1, 2, 3, 4 and 5 on hypothetical social problems.

LESSON 18

- Students brainstorm potential consequences of previously generated solutions.

LESSON 19

- Introduce step 6: **PICK THE BEST**
- Main ideas:

  - Picking the best means evaluating the consequences of each solution.
  - All solutions have good and bad aspects.
  - Consequences for both oneself and for others must be considered.
- Introduce idea of a balance sheet for evaluating pros and cons of a solution for oneself and for the other(s).
- Students apply steps 1, 2, 3, 4 and 5 to a presented problem. Students fill out personal balance sheet by listing pros and cons of each solution. Balance sheets will be unique to each student. Tally balance sheet and identify three best solutions. Choose a solution. Discuss as a group.

LESSON 20

- Same as lesson 19.

LESSON 21

- Teach step 7: **BE PREPARED**
- Main ideas:
  - Being prepared requires:
    1) Thinking of all the things that could go wrong with a solution and then thinking how to deal with them.
    2) Thinking of all the little steps needed to carry out the solution. Think of these in sequential order.
    3) Thinking of a back-up plan in case the chosen solution does not work or cannot be used.
- Students practice steps 1, 2, 3, 4, 5, 6 and 7 on presented problems.

LESSON 22

- Teach step 8: **TAKE ACTION**
- Main idea:
  - Take action means to carry out your chosen plan.
- Teach step 9: **CHECK IT OUT**
- Main ideas:
  - Check it out means that after a solution is implemented it is necessary to evaluate if the other(s) are satisfied and if you are satisfied with the way things turned out.

- It is also necessary to make sure that no other problems were created.
- If you or the other are not satisfied then use your back-up plan or go back to step 5. If other problems were created then go back to step 1.

- Students practice steps 1, 2, 3, 4, 5, 6, 7, 8 and 9 on hypothetical problem scenarios.

APPENDIX F

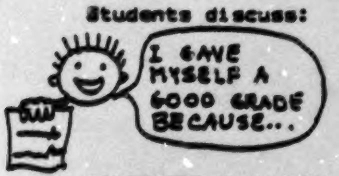
Sample Lesson

SESSION 11

Objectives: I. Review contracts
II. Begin step 4: state the problem and goals

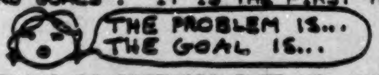
Students do: Write on your self report card the three grades you give yourself.

Students discuss: Share with the group why you gave yourself a good grade or why you gave yourself a poor grade. Who predicts they will do better next time. Why? Who predicts they will do worse. Why?


I GAVE MYSELF A GOOD GRADE BECAUSE...

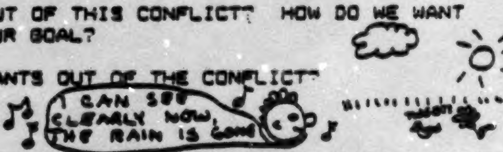
LOOK AT POSTER #1. YOU WILL SEE THAT STEPS 4,5,6,7,8 and 9 ARE ACTION STEPS IN HOW TO THINK OUT WHAT TO DO. EVERYTHING YOU HAVE LEARNED SO FAR —RECOGNIZING A PROBLEM EXISTS, GETTING READY TO THINK AND GETTING THE FACTS—WILL HELP YOU USE STEPS 4,5,6,7,8, AND 9 SO THAT YOU WILL TAKE THE SMARTEST ACTION.

TODAY WE START ON PROBLEM SOLVING STEP 4. STEP 4 SAYS "STATE THE PROBLEM AND GOALS". IT IS THE FIRST THING TO DO AFTER GETTING THE FACTS.


THE PROBLEM IS...
THE GOAL IS...

WHEN SOMETHING IS DISTURBING TO US, WHEN WE ARE UPSET OR WHEN WE ARE DEALING WITH DIFFICULTIES IT IS VERY IMPORTANT THAT WE GET CLEAR IN OUR MINDS

1. WHAT IS THE SPECIFIC PROBLEM?
2. WHAT IS IT THAT WE WANT OUT OF THIS CONFLICT? HOW DO WE WANT IT TO END UP? WHAT IS OUR GOAL?
3. WHAT IS IT THE OTHER(S) WANTS OUT OF THE CONFLICT? WHAT IS THEIR GOAL?


I CAN SEE CLEARLY NOW THE RAIN IS GONE

IT IS VERY IMPORTANT TO HAVE CLEAR IN YOUR MIND WHAT THE EXACT PROBLEM IS. PEOPLE WHO RUN INTO TROUBLE IN SOCIAL CONFLICTS DO NOT HAVE CLEAR WHAT THE PROBLEM IS. IF YOU WNAT TO SOLVE THE PROBLEM YOU MUST STATE EXACTLY WHAT THE PROBLEM IS.

THERE ARE TWO WAYS TO FIGURE OUT EXACTLY WHAT THE PROBLEM IS. THE FIRST WAY IS TO STATE CLEARLY WHAT HAPPENED THAT MADE YOU OR SOMEONE ELSE UPSET. YOU MUST STATE EXACTLY WHAT THE OTHER(S) DID OR WHAT YOU DID.

BELOW ARE SOME PROBLEMS. TELL WHICH ONE IS STATED CLEARLY.

1. The problem is that Sheila bugs me.
   The problem is that Sheila gives me putdowns and calls me names.

2. The problem is that I'm a failure.
   The problem is that I did not pass math class.

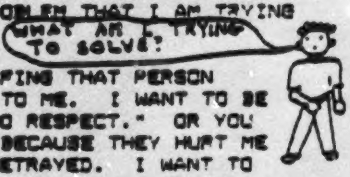
3. The problem is that Mark bullies all the younger and smaller guys and I feel helpless to stop him.
   The problem is that I hate Mark.

THERE IS A SECOND WAY TO FIGURE OUT EXACTLY WHAT THE PROBLEM IS. DO YOU REMEMBER WHAT PROBLEM SOLVING STEP #2 SAYS? RIGHT! STEP #2 IS RECOGNIZE THAT A PROBLEM EXISTS. WE ALSO LEARNED THAT ONE OF THE WAYS TO RECOGNIZE THAT A PROBLEM EXISTS IS WHEN YOU GET READY TO BREAK A RULE OR LAW. THIS IS A SIGNAL THAT YOU HAVE A PROBLEM.

NOW YOU HAVE TO FIGURE OUT EXACTLY WHAT YOUR PROBLEM IS!!

HERE IS HOW TO FIGURE OUT WHAT YOUR PROBLEM IS WHEN YOU ARE THINKING OF BREAKING A RULE OR LAW. ASK YOURSELF...WHAT AM I TRYING TO ACCOMPLISH BY BREAKING THIS LAW OR RULE? WHAT IS IT I WANT? WHY WOULD I WANT TO DO THIS?

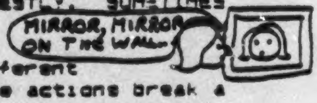
TALK TO YOURSELF LIKE THIS: "IF I BREAK THIS RULE, I MUST BE TRYING TO SOLVE SOMETHING. BREAKING THIS RULE IS MY SOLUTION TO SOME PROBLEM I HAVE. WHAT AM I TRYING TO SOLVE? WHAT IS MY PROBLEM THAT I AM TRYING TO SOLVE?


WHAT AM I TRYING TO SOLVE?

YOU MIGHT SAY TO YOURSELF " I AM THINKING OF KNIFING THAT PERSON BECAUSE I WANT MY FRIENDS AND OTHERS TO LOOK UP TO ME. I WANT TO BE ADMIRED. I WANT TO SOLVE MY PROBLEM OF HAVING NO RESPECT." OR YOU MIGHT SAY "I AM THINKING OF KNIFING THAT PERSON BECAUSE THEY HURT ME SO BAD. I WANT TO SOLVE MY PROBLEM OF FEELING BETRAYED. I WANT TO STOP FEELING SO HURT AND SAD."

IT IS NOT EASY TO ASK YOURSELF WHY YOU ARE DOING SOMETHING. YOU HAVE TO BE VERY HONEST WITH YOURSELF IF YOU WANT TO FIGURE OUT YOUR PROBLEM. OFTEN IT IS NOT EASY TO SEE OURSELVES HONESTLY. SOMETIMES THE TRUTH HURTS.

BE HONEST!


MIRROR, MIRROR ON THE WALL

Students: Listed below are 5 actions that different people are thinking of doing. These actions break a law or rule so this is a signal that the person has a problem. Pretend you are that person.

Discuss what your problem might be.

Remember there is more than one answer. Try to think of as many possible problems that each action could indicate. Think about yourself in the situation. What does this behavior tell you your problem might be?

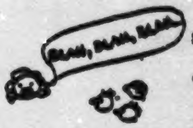
1. Getting loaded on weed or coke.
2. Stealing a tool from class for a friend.

3. Sneaking contraband into School after a home visit.

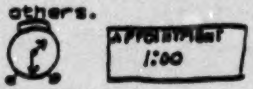
4. Flipping the teacher off behind her back?
5. Intimidating another person by the use of threats into giving me what I want.
6. Cheating on a test.

BELOW ARE SOME ACTIONS WHICH ARE NOT ILLEGAL. THESE ACTIONS CAN ALSO TELL YOU WHAT PROBLEM YOU OR ANOTHER MIGHT HAVE. DISCUSS WHAT PROBLEMS THESE ACTIONS REVEAL ABOUT THE PERSON?

7. Telling someone that their boyfriend has eyes for another.



8. Insulting someone as they walk by.
9. Always complaining to others.
10. Always being late.



11. Bragging about sexual experiences.
12. Bossing others around.
13. Always buying things for others and always doing them favors.

REMEMBER...YOUR PROBLEM IS PROBABLY NORMAL AND NOT WEIRD. YOU PROBLEM WILL NOT GET YOU INTO TROUBLE. BUT YOUR SOLUTION IS WHAT COULD GET YOU INTO TROUBLE. BE CAREFUL OF YOUR SOLUTIONS.

YOU HAVE LEARNED HOW TO FIGURE OUT WHAT PROBLEM YOU MIGHT HAVE AND HOW TO STATE YOUR PROBLEMS CLEARLY.

Students: There are two ways to figure out what the problem is. What are these two ways?

NOW WE ARE GOING TO TALK ABOUT HOW TO STATE YOUR GOALS AND THE GOALS OF THE OTHERS INVOLVED IN THE SITUATION. REMEMBER THIS IS STEP #4 AND STEP# 4 SAYS "STATE THE PROBLEM AND GOALS".

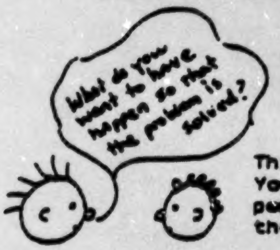
SOMETIMES YOU CAN THINK OF YOUR GOALS USING THE WORDS BELOW.
get, keep, get back, do, get rid of, avoid, prevent, escape.

stop, to have

FOR EXAMPLE, YOU MIGHT SAY "I WANT TO GET MY GIRL BACK" OR "I WANT TO PREVENT ME FROM BEATING THEM UP" OR "I WANT TO STOP HIM FROM INSULTING ME" OR "I WANT TO AVOID GETTING A WRITE UP" OR "I WANT TO DO A GOOD JOB ON THIS PROJECT" OR "I WANT TO HAVE SOME FUN."

Teacher: Read aloud 3-5 conflict situations.

Students: Listen to the conflict situation and state


What do you want to have happen so that the problem is solved?

1) what is the problem?
2) what does the main character want? What is their goal?
3) what does the other want? What is their goal?

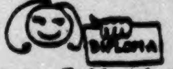
Think of 5 possible goals for each person involved. You willl have to make up possible goals of each person in the situation. Remember you find out what the other person wants BY ASKING THEM.

STATING WHAT YOU WANT TO HAVE HAPPEN OR HOW YOU WANT THE PROBLEM TO TURN OUT IS THE SAME THING AS STATING YOUR GOALS. ASKING WHAT THE OTHER(S) WANTS TO HAVE HAPPEN OR HOW THE OTHER WANTS THE PROBLEM TO TURN OUT IS THE SAME THING AS FINDING OUT THE OTHER'S GOALS.

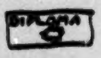
YOU MUST BE SURE TO STATE WHAT YOU WANT AND WHAT THE OTHER WANTS.

WHEN YOU HAVE A PROBLEM YOU WILL HAVE A GOAL FOR THAT PROBLEM. THIS GOAL IS YOUR SHORT TERM GOAL OR YOUR IMMEDIATE GOAL. IT IS YOUR GOAL FOR THE SITUATION AT THE MOMENT.

BUT! YOU WILL PROBABLY ALSO HAVE OTHER GOALS AT THE SAME TIME. THESE ARE YOUR LONG TERM GOALS OR GOALS YOU HAVE FOR YOU LIFE IN THE FUTURE. THESE ARE NOT GOALS FOR THE SITUATION AT THE MOMENT. LONG TERM GOALS ARE THINGS YOU WOULD LIKE TO ACCOMPLISH FOR YOURSELF AS YOU LIVE YOUR LIFE. LONG TERM GOALS MAY TAKE WEEKS, MONTHS OR YEARS TO ACHIEVE.

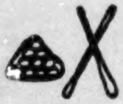


Students: Tell if the goals listed below are long term or short term? Why do you think so?



a) To get a high school diploma.
b) To get loaded tonight.
c) To avoid level B write ups while at School.
d) To avoid a fight with Joe because of the argument we're having right now.
e) To impress the girl who just walked into class.
f) To get a better job.

JOB APPLICATION

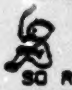


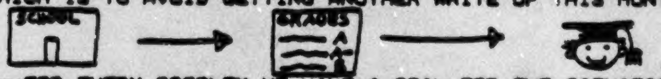
g) To earn a phase 5.
h) To win the ball game tonight.
i) To become the best pool player in the school.
j) To pay Marie back for what she did.
k) To keep my freedom and stay out of prison.
l) To stir up some excitement.

WHEN WE ASK WHAT IT IS WE WANT NOW OR WHAT IS OUR GOAL WITH THIS PROBLEM WE NEED TO REMEMBER THAT WE MAY ALSO HAVE A LONG TERM OR BIGGER GOAL THAT IS AFFECTED BY WHAT WE DO TO SOLVE THE IMMEDIATE PROBLEM. YOUR SOLUTION TO THE PROBLEM YOU FACE RIGHT NOW WILL AFFECT YOUR GOALS OF THE FUTURE.

Students: How can a long term goal be affected by what we do to achieve our short term goal?

OUR GOAL OF THE MOMENT MIGHT BE TO HAVE A GOOD TIME TODAY. IF WE DECIDE TO ACHIEVE THAT GOAL BY CUTTING SCHOOL THEN IT WILL AFFECT OUR LONG TERM GOAL WHICH IS TO GET GOOD GRADES IN ORDER TO GRADUATE. ANOTHER EXAMPLE MIGHT BE THAT OUR GOAL OF THE MOMENT IS TO NOT LOOK LIKE A PRESSURE CASE IN FRONT OF OUR FRIENDS. IF WE ACCOMPLISH THAT GOAL BY GETTING INTO A FIGHT WITH JULIE THEN THIS WILL AFFECT OUR LONG TERM GOAL WHICH IS TO AVOID GETTING ANOTHER WRITE UP THIS MONTH.



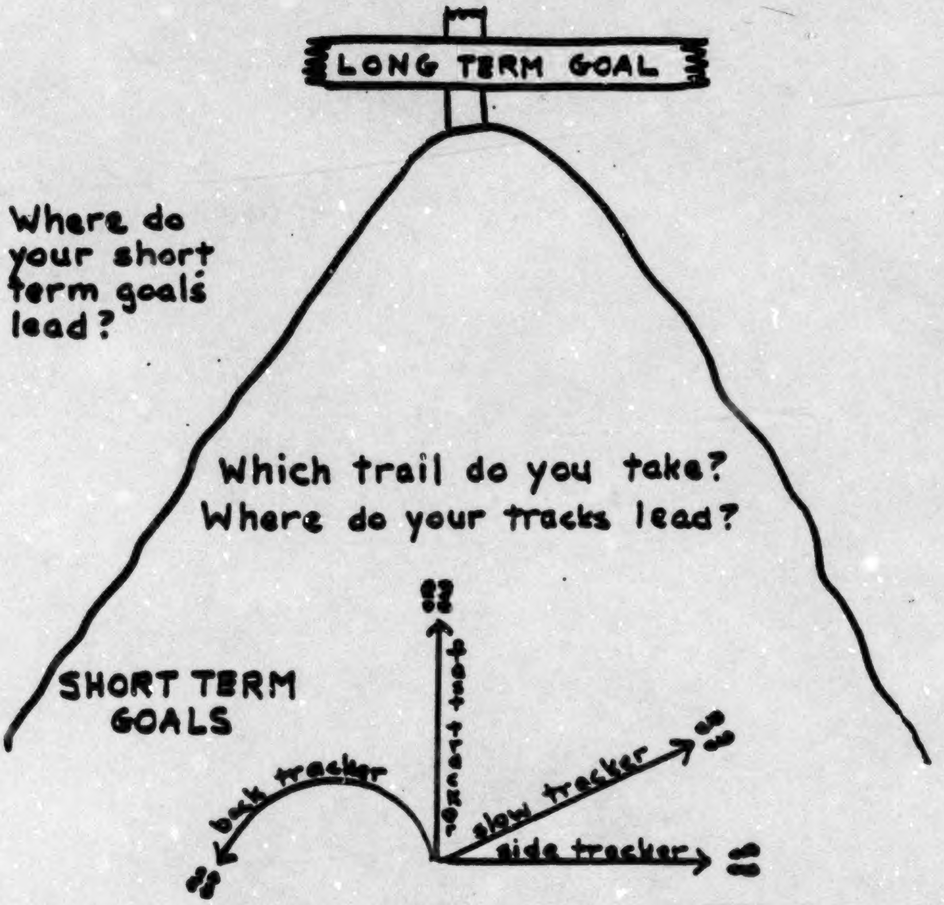


SO REMEMBER—FOR EVERY PROBLEM WE HAVE A GOAL FOR THE SITUATION OF THE MOMENT AND WE ALSO HAVE ANOTHER LONG TERM GOAL. THIS LONG TERM GOAL CAN BE HURT OR HELPED BY HOW WE HANDLE THE SITUATION AT THE MOMENT. SOME PEOPLE FORGET THAT WHAT THEY DO NOW CAN AFFECT THEM TOMORROW, NEXT WEEK, NEXT MONTH, NEXT YEAR AND MAYBE FOR THEIR ENTIRE LIFE.

Homework: Practice problem solving steps 1,2,3 and 4.

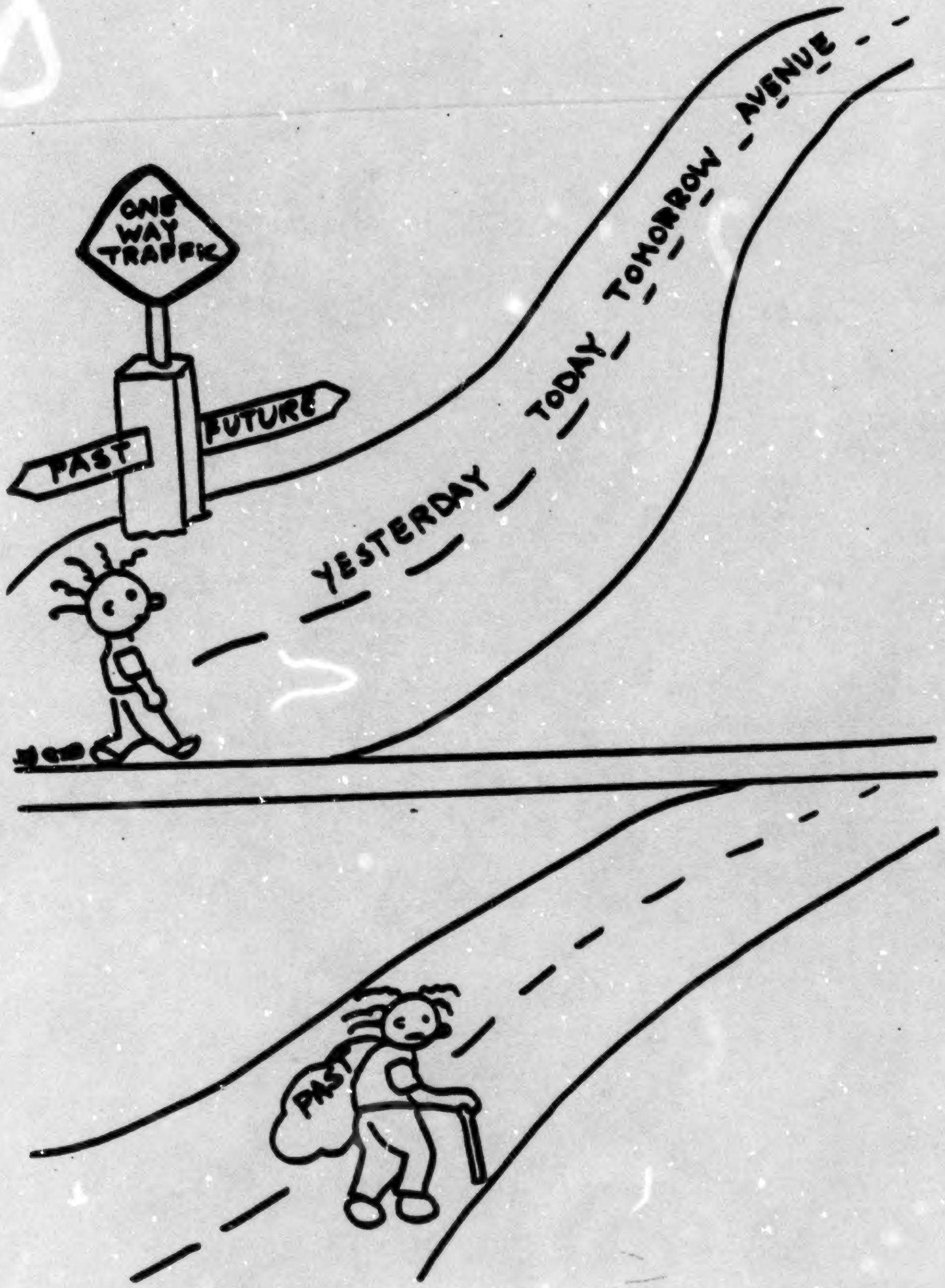
Observe youself taking action and ask yourself what is it you are trying to accomplish or get. What is your problem that your action is trying to solve.

Observe yourself in conflicts and state in your own mind exactly what it is you want now and what you want in the future. Ask the other what they want. Also state what is the conflict.


LONG TERM GOAL
Where do your short term goals lead?
Which trail do you take?
Where do your tracks lead?
SHORT TERM GOALS
back tracker
fast tracker
slow tracker
side tracker

Does your short term goal:

	yes	no
help your long term goal?	☐	☐
hurt your long term goal?	☐	☐
leave alone your long term goal?	☐	☐


ONE WAY TRAFFIC
PAST
FUTURE
YESTERDAY
TODAY
TOMORROW
AVENUE
PAST

APPENDIX G

A Note on Internal/External Validity and Multiple Regression Analysis

Regression procedures enhance examination of internal validity by supporting causal inferences through increased explanation of the research sample. This is accomplished by determining how much variance in the dependent variable was accounted for by treatment. Shapiro (1984) refers to this use of regression as an *ed–psychometric approach* primarily concerned with determining if treatment is a highly probable explanation of changes in the dependent variable. Conversely, regression procedures can be used to enhance examination of external validity by inferring generalizability of relationships found in the sample to the population from which the sample was drawn. This is accomplished by determining if treatment incremented changes in the dependent variable over and above the influence of other powerful variables which predictably have an influence on members of the sample population. Shapiro refers to this use of regression as an *econometric approach* primarily concerned with determining if treatment helped reduce uncertainty in explaining the dependent variable. Reducing uncertainty in explaining some phenomenon is an important activity of model building, thus the usefulness of an econometric perspective is apparent when treatment is based upon a theoretical model, as was the case in this investigation. Since this investigation was an attempt to increase explanation of delinquency by postulating a theoretical model, the econometric perspective was considered useful for making inferences about generalizability of the theoretical model. Regression analysis, for examining external validity, requires that competing non-treatment variables be identified and entered into the regression equation. What factors can be expected to compete with treatment in influencing dependent variables proposed in this study? Sex, race and mental ability are basic human characteristics consistently found to influence a wide range of human behaviors. Thus it seemed reasonable to expect demographic variables of race, sex and PPVT language age (as a correlate of IQ) to powerfully influence dependent variables examined in this investigation. Therefore, regression analysis was used to measure relative effects of treatment in terms of sex, race and PPVT and to determine if treatment incremented changes in dependent variables above and beyond the expected influences of sex, race and PPVT. Are there additional variables specific to a delinquent population which can be expected to influence behavior? To address this question, correlations between measures of a student's personal history and measures of institutional behavior at pre-treatment were computed. As expected, moderate correlations were found between some overt behavior measures and personal history factors of gang affiliation, severity of committing offense and number of prior convictions. Therefore, these personal history variables were added to the regression equation to determine if treatment was able to influence behavior to any degree beyond influences of these powerful and comprehensive factors.

APPENDIX H

Number of Missing Cases by Group for Each Dependent Variable Analysis

Variable	LD Treat	LD Attention	LD Test-only	NLD Treat	NLD Attention	NLD Test-only
Quantity of Meta-Awareness	1	0	1	0	0	0
Type of Meta-Other	0	0	0	0	0	1
Type of Meta-Self	0	0	0	0	0	1
R^2 Meta-Awareness	0	0	0	0	0	0
API Quantity Solution	0	0	0	0	0	0
API Average Quality	0	0	0	0	0	0
API Best Quality	0	0	0	0	0	0
API Proportion of Competent/Incompetent subjects	0	0	0	1	0	0
Self-Efficacy	0	0	0	0	0	0
R^2 Self-Efficacy	0	0	0	0	0	0
Meta-Self Assessment	0	0	1	0	0	0
Self-Ratings	0	0	N/A	0	1	N/A
Devereaux Improved/Worsened	0	0	2	2	0	2
Improved Behavior Reports	2	1	1	2	1	2
R^2 Behavior Reports		collapsed LD=1			collapsed NLD=1	
Improved Phase Level	2	1	1	2	1	2
Both Improved Behavior Reports and Phase Level	2	1	1	1	1	2

LD vs. NLD t—tests:

Behavior reports	collapsed LD = 0	collapsed NLD = 0
No reports	collapsed LD = 1	collapsed NLD = 1
Good days credit	collapsed LD = 3	collapsed NLD = 3
Highest phase level	collapsed LD = 2	collapsed NLD = 4

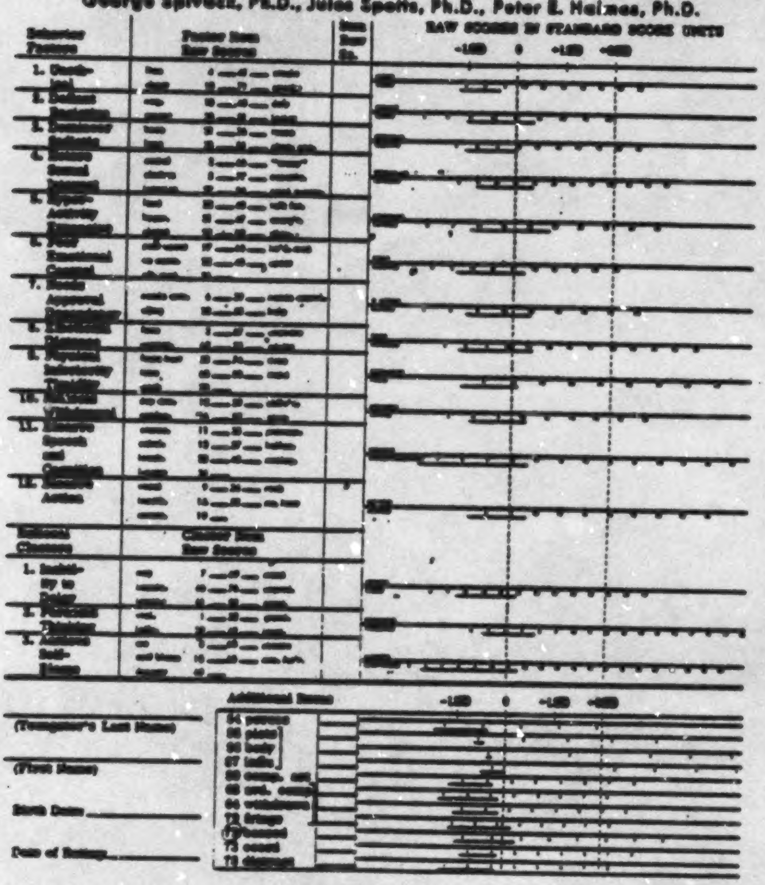
APPENDIX I

Devereaux Protocol

DEVEREUX ADOLESCENT BEHAVIOR (DAB) RATING SCALE*

(DAB Profile)

George Spivack, Ph.D., Jules Spotts, Ph.D., Peter E. Haimes, Ph.D.



(Youngster's Last Name)

(First Name)

Birth Date__________

Date of Rating__________

Age__________ Sex __________ IQ__________

Rater's Name ____________________ Relationship to Youngster ____________________

APPENDIX J

A Note on Meta—Analysis

Meta-analysis is a quantitative procedure which describes magnitude of experimental effect in standard deviation units so that treatment effect size (*ES*) is rendered comparable for different groups receiving treatment.

Effect size is calculated as:

$$ES = \frac{\overline{X}_e - \overline{X}_c}{S_c}$$

The mean of the experimental group minus the mean of the control group, divided by the standard deviation of the control group. Thus, ES represents magnitude of effect, transformed by a standard mean difference, to a common scale.

The ES is comparable to a z-score and was derived for LD and NLD relative to their respective test-only control group. Therefore, LD and NLD groups can be directly compared regarding how strongly each group was affected on a given dependent variable. See Note 6, Cornelius (1983) for a critique of meta-analysis.